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Art. 8. Archontophœnix
Art. 9. Quædam Ptychospermatæ hortulanorum

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Occasional Papers on the Kinds of Plants

By L. H. Bailey

8. The King Palms of Australia—Archontophœnix

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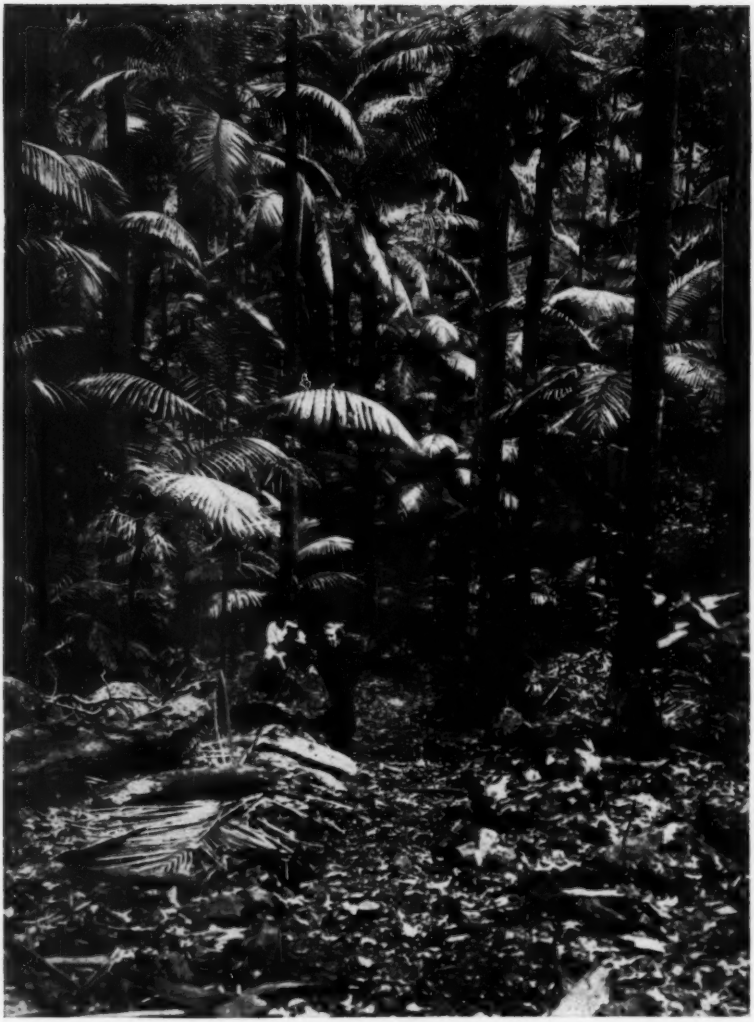

FIG. 227. FOREST of *Archontophœnix Cunninghamiana* on Tambourine Mountain, Queensland, Australia.

Known in cultivation erroneously as *Seaforthia elegans*.

Photographs for Figs. 227, 229, 230, 232, 233, 236 were supplied by Mr. C. T. White of Queensland, Nos. 227 and 230 having been taken by Mrs. Herbert Curtis, and Nos. 232 and 233 by Mr. A. Musgrave. Remaining photographs in Fascicle viii are by the author.

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ARTICLE 8. THE KING PALMS OF AUSTRALIA

Archontophœnix

Two or three beautiful feather-leaved tree palms of Queensland frequently planted in the tropical and warm-temperate parts of the western hemisphere and also in southern Europe and elsewhere are much confused in the minds of planters by unfortunate misidentification and by changes in nomenclature.

As a group these palms have no recognized English name; to remedy this defect it is proposed to call them the king palms (Hortus, 1930), in a rendering of Archontophœnix, the generic name, from the Greek *archon*, king, chief, or ruler, and *phœnix*, palm; we may be the more ready to adopt the name because it well suits the stature and distinguished appearance of these trees. It is the equivalent of the German herrscherpalme, applied to the group. That the reader may understand at the outset what palms are now in mind, we may speak of them as *Archontophœnix Cunninghamiana* and *A. Alexandræ* together with its var. *Beatricæ*, and say that they are also known as *Seaforthia elegans* and *Loroma*.

Striking marks of difference between the two species of Archontophœnix in general cultivation are the green under surface of the broad pinnæ of the Cunningham palm with secondary nerves or ribs not prominent, and the gray-white under side of the narrower pinnæ of the Alexandra palm and the very pronounced secondary nerves giving the parts a much-ribbed appearance (Fig. 228). The trunk is also somewhat enlarged or bulged at and near the base in the Alexandra palm.

The general habit of these trees is not unlike the royal palms of the genus Roystonea (Oreodoxa) and the two groups are often confused by casual observers. This resemblance in Archontophœnix lies in the canopy-like crown or head above a crownshaft (Gent. Herb. iii, 12) of smooth green leaf-sheath with the flower-clusters at the base of it.

The botanical history of the king palms begins in 1857 when W. J. Hooker figured one of them, from a tree growing under glass in the Royal Gardens, at Kew, England, in the Botanical Magazine (t. 4961) as *Seaforthia elegans*, mistaking the plant for the true *S. elegans* of Robert Brown; and this error is perpetuated to the present day in horticultural usage. Seeds are still in the trade as *Seaforthia elegans*. Dr. Udo Dammer called horticultural attention to this error in the Gardeners' Chronicle of London as long ago as 1902, with striking photographs, as Hermann Wendland had published the botanical correction many years earlier in Germany. Hooker refers to the earlier account and the figures of Martius in his great Historia Naturalis Palmarum, but that author had another palm, the true *Sea-*

forthia elegans of Brown. Hooker records that seeds of his plant were sent to Kew by Allan Cunningham, collector in Australia; and one of these plants, "having attained a height of twenty-eight feet from the ground, produced its racemes of flowers of a pale, dull, lilac colour, from the side of the dark green, graceful trunk"; this was in the autumn of 1856. "These flowers were, none of them, succeeded by fruit"; and the three details of fruit on t. 4961 are copied from Martius and are true *Seaforthia* (or *Ptychosperma*) *elegans*. Nothing is said by Hooker about the character of the

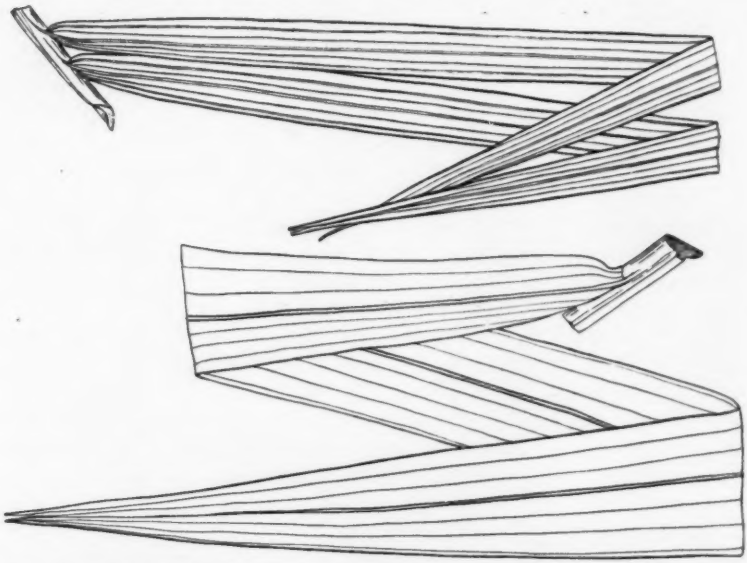


FIG. 228. PINNÆ OF KING PALMS (× about ½). Above, two strongly ribbed leaflets of *Archontophœnix Alexandræ* var. *Beatricæ*; below, one folded leaflet of *A. Cunninghamiana*.

under surface of the pinnæ, but we may assume it was green for if the leaves had been prominently whitened beneath he undoubtedly would have noted and recorded the fact. Neither does he mention secondary nerves or ribs.

Martius did not account for the king palms, now named Archontophœnix, as they were unknown at the time of his publication.

The second event in the history of the king palms is the correction of the Botanical Magazine error (t. 4961) by Hermann Wendland of Hanover, in Botanische Zeitung, 1858, and the designation of the Hookerian plant as *Ptychosperma Cunninghamiana*. Here is the beginning of the botanical identity of the Cunningham palm, but later botanists have often erroneously written the name *Cunninghamii*. In 1894 Botanical Magazine pub-

lished another plate (t. 7345) of the supposed true *Ptychosperma* (or *Seaforthia*) *elegans*, and in a footnote J. D. Hooker says that the former plate 4961 does not represent the true *Seaforthia elegans* of Brown but is "a good figure of *P. Alexandræ*, with the fruit of *P. elegans*, copied from Martius"; we have seen, however, that the name of this palm is *P. Cunninghamiana*, now transferred to Archontophœnix as *A. Cunninghamiana*.

The third event is the description of a second species of the group. Ferdinand von Mueller in 1865-66 founded *Ptychosperma Alexandræ* in the fifth volume of his Fragmenta Phytographiæ Australiæ. In due course it

Archontophœnix Cunninghamiana *Archontophœnix Alexandræ*

FIG. 229. THE TWO ARCHONTOPHŒNICES as seen in the Botanic Gardens, Brisbane, Queensland. Very like in general appearance at a distance but differing in trunks.

was transferred to the genus Archontophœnix as *A. Alexandræ*. This species is described as a superb palm, 70 to 80 feet tall. He speaks of the ashy-glaucous under surface of the pinnæ and the prominent lateral nerves; the spathe was unknown to him. The plant was collected by Bowman on Fitzroy's River, which is in central Queensland. E. M. Bowman was an early station- or ranch-owner in that territory, interested in botany and sent specimens to Mueller. (There are two Fitzroy rivers, one in West Australia). The palm is accredited by Mueller to very dense shady woods although his lithograph illustration of the tree in nature, drawn by himself, shows the trees growing in open plains country; F. Manson Bailey in the Queensland Flora says the illustration is "not good," the stem being too slender. Mueller has a second plate showing structural details. These illustrations are carefully copied in Flore des Serres, xviii, t. 1916, in 1869-70. This noble palm was dedicated to Princess Alexandra.

The fourth event, in the unfolding of the king palm record, is the founding of a new genus, *Archontophœnix*, for these palms by Hermann Wendland and Oscar Drude in Linnaea, 1875. Here the species become *Archontophœnix Alexandræ* and *A. Cunninghamiana*. A variety *schizanthera* of *A. Alexandræ* is added, differing in characters of inflorescence; subsequent botanists appear not to have recognized this form.

Both these king palms are planted on the Riviera. Dr. Dammer states in Gardeners' Chronicle, January 11, 1902, that "the plants were exposed to 6½ R. without any harm" in that region; this is about 46 F. Pictures of the species are to be found in Figs. 227-238.

A third described species of Archontophœnix is *A. Veitchii*, Wendland and Drude, in Linnaea, xxxix, 213 (1875). It was introduced by Veitch and said to be native in the oriental coast region of subtropical Australia; the authors mention Rockhampton and "Goold Island" in the bay; this is in Queensland, but F. M. Bailey does not account for the species in The Queensland Flora nor in the more recent Comprehensive Catalogue of Queensland Plants. Burret in Notizblatt des Botanischen Gartens und Museums, x, 3, 111 (March, 1928) refers *A. Veitchii* to *A. Cunninghamiana*, but Rockhampton, the type locality for *A. Veitchii*, is on the Fitzroy River. Gould Island is also in Keppel Bay in the same district. This is the type locality for *A. Alexandræ*. Mr. C. T. White of Queensland writes that *A. Cunninghamiana* is not known to occur in the neighborhood of the Fitzroy River. This would appear to make the plant *A. Alexandræ*, although the original description particularly says that the leaves are green and not white-pruinose underneath. The identity of the plant is yet to be determined. It is not definitely stated whether the original stock was from wild or planted trees although one infers it was feral.

FIG. 230. GROUP OF CUNNINGHAM OR PICCABEEN PALM, *Archontophœnix Cunninghamiana*, at blooming time on Tambourine Mountain, Queensland.

Another event in the phytography of the genus is the addition of *Archontophœnix Beatricæ*, F. M. Bailey in Queensland Flora in 1902, where it is transferred from Ptychosperma in which genus it was established by Ferdinand von Mueller in 1882 in the Chemist and Druggist, published in Melbourne; the tree was from Mount Elliott, northern Queensland, between Ayr and Townsville; it was dedicated to Princess Beatrice. It is called step palm from the circumstance that the trunk is "much enlarged at the base and there the rings formed by the scars of fallen leaves are unusually prominent." F. Manson Bailey thinks there is nothing to separate this palm from *A. Alexandræ*, however, and adds that he has never seen specimens. The palm was collected by Mr. E. Fitzalan, who is quoted in Mueller's account as stating that the stems or trunk "remain almost as soft as a cabbage stalk" whereas those of *A. Cunninghamiana* and *A. Alexandræ* are very hard, the stem of *Cunninghamiana* "will sometimes turn the edge of a tomahawk."

The Beatrice palm is planted somewhat in Australia and it has been recognized in the Gillespie estate near Santa Barbara, California. It appears to be a form of *A. Alexandræ*, with stout heavily ringed bole and a leaf-crown not drooping. We shall meet it again on page 409.

Inasmuch as the original description of *A. Beatricæ* in the Chemist and Druggist of Australia is not likely to be available in the United States, it is here reprinted, having been copied for the writer in Victoria:

Ptychosperma Beatricæ, F. v.M. Stem robust, moderately high, its basal portion much enlarged, with the annual rings there suddenly and considerably impressed; leaves large, rigid, many of them more erect than divergent; the rachis very straight; their segments numerous, gray underneath, folded back towards the base, gradually narrowed into a pointed apex, not very spreading, the terminal segments and those nearest to them somewhat convergent to their summit; panicle moderately long, somewhat fascicular, emanating from the stem at no very great height, bearing numerous crowded slender and flexuous spikes; buds rather pointed, hardly oblique; male flowers mostly in pairs, and often a female flower between them; outer sepals from one-third to nearly half the length of the inner sepals; the stamens eight to twelve; anthers linear, longer than the filaments; fruits rather small, globular-ovate. On Mount Elliot. Fitzalan. Greatest height of whole plant 40 feet. Stems solitary from the root; leaf stalks channelled, raches of the spikes dark-coloured when dry; flowers evidently smaller than those of Pt. Alexandræ and Pt. Cunninghami, but not available at present in full development. Fruits in size, form and structure similar to those of the above mentioned species but rather smaller.

In contrasting such differences, as are best or only observable in native localities, Mr. Fitzalan remarks—"the stem of Pt. Alexandræ has woody fibres enough to allow of its sometimes being used (I might say sacreligiously) for fencing, etc., while stems of the new palm remain almost as soft as a cabbage stalk; and while, contrarily again, the stem of P. Cunninghami, which is still harder than P. Alexandræ, will sometimes turn the edge of a

tomahawk." He further notes that the basal portion of the stem is "much more massive than that of Pt. Alexandræ."

The Beatrice Palm "flowers and fruits already 6-8 feet from the ground when evidently still very young, whereas the two sister species do not bear fruits at a lesser distance from the stem than about 30 feet."

A fifth species was described by F. M. Bailey in Queensland Agricultural Journal, ii, 129 (1898), as *Archontophœnix Jardinei*, but it was subsequently

FIG. 231. FLOWER-CLUSTERS, at base of crownshaft, of *Archontophœnix Cunninghamiana*, in southern Brazil; new cluster at right.

placed by him in Ptychosperma; this palm we shall meet again in the sequence, Article 9.

Latest event in the botany of the cultivated king palms is the founding of the new genus Loroma by O. F. Cook in the Journal of the Washington Academy of Sciences, volume v, 1915. This arresting paper was the first critical study accorded these palms in America, at a time when they were little recognized here and the Australian species little understood, and the publication did much to bring them to attention. Dr. Cook speaks of "one pinnate-leaved palm" that is "commonly planted in the open air in California," aside from the several species of Phœnix and Cocos, "usually known as *Seaforthia elegans*, but has also been called *Ptychosperma elegans*, *Archontophœnix Alexandræ*, and *Archontophœnix Cunninghamiana*." He states that acquaintance with the true *Archontophœnix Alexandræ* was made by him in 1905 at Cordoba, Mexico, where a tree was growing with "fruit and seed" "agreeing closely with Mueller's original description and figures." He had also seen "the genuine *Seaforthia elegans*" at the Belize Botanical Station, British Honduras; the identification of this palm "led to a recognition of the fact that the California palm was different from all of the species to which it had been supposed to belong."

Cook concludes that the palm grown in California is not an Archontophœnix and proposes for it the name *Loroma amethystina*, the specific name indicating the purple or lilac or "rather bright pinkish purple" flowers; the type of the genus is "cultivated in California, probably from Australia." He mentions seeds from Australia in the collections in Washington that are of this species "or at least a member of this genus." He assumes that the type species of the genus Archontophœnix is Mueller's *A. Alexandræ*, but we have seen that the older of the two species, by several years, is *A. Cunninghamiana*, and in the founding of the genus Archontophœnix by Wendland and Drude (Linnaea, xxxix, 182-3) a type species is not mentioned, although it is evident from the description that the authors drew on the characters given by Mueller for his single species. "The derivation of the generic name (Loroma) refers to the strap-like form of the fibers surrounding the seed."

As we have seen, Cook regards the genus Archontophœnix as represented by *A. Alexandræ*; and he apparently knew it on this side the ocean in the tree he studied in Cordoba, Mexico. The palm planted in California is his *Loroma amethystina*, and to this genus he also refers the Cunningham palm of northern Australia (although he did not know it in cultivation) as *Loroma Cunninghamiana*. He gives us no characters of separation between *L. amethystina* and *L. Cunninghamiana;* in fact, the latter is only a new combination of names, having been transferred from *Ptychosperma Cunninghamiana* to Loroma; but having introduced *Loroma amethystina* into the case, the relations of the other two species to it are not sufficiently

cleared. The California king palm is, under this treatment, a single species.

This opinion is repeated by him in Standardized Plant Names, 354-5 (1923): "Commonly planted in southern California under the names Archontophœnix (or Ptychosperma) alexandræ and Seaforthia (or Ptychosperma) elegans, neither of which is known to be in cultivation in the United States. Archontophœnix cunninghami is the name of another, and little known, Australian palm, but the trees cultivated in California under that name appear to be identical with Loroma amethystina."

Later, however, Cook recognized two species in California, with striking photographs (Journal of Heredity, Sept. 1927, 410, 417). One of them is Loroma; the other is Archontophœnix, without mention of particular name so that we do not know what species it is supposed to represent. He speaks of them as "natives of Queensland, which also flower and fruit in the open air in the coast districts of California." He figures a tree of Archontophœnix from southern Florida.

Botanical Discussion

To understand the situation one must know something of the floral structure in the king palms, particularly as the points of disagreement lie largely in the pistillode, or the rudimentary pistil in the staminate flower, and in the fruits.

These palms are essentially monœcious, inasmuch as the functionally staminate elements are in separate flowers from the pistillate. The flowers are very small, as in general in palms, but the structure is simple and readily observed. Three flowers stand normally at each node or bend on the slender floral axis or rachilla, the central one being small and pistillate, the lateral ones larger and staminate; the pistillate flower may bear staminodes (undeveloped functionless stamens), and the staminate flower a pistillode. Frequently, perhaps usually, one or two of the flowers may fail or be absent at a node, and other irregularities may appear, so that there may not be uniform placement throughout the inflorescence; and we shall find that there may be variation in the organs themselves. Details in Fig. 234 make some of these structures clear.

Attachment of the staminate flowers is slight; they soon fall, many of them before expanding, and the scar is scarcely discernible. The strand is soon left, therefore, with only the small rounded pistillate flowers firmly attached and each one sitting in a saucer-like cup, and very soon these flowers begin to enlarge (if fertilized) into fruits. Pollination is interestingly discussed by Alexander F. Skutch in Torreya for March-April, 1932 (vol. xxxii, 29-37).

In the original description of Archontophœnix by Wendland and Drude, the pistillode is described as style-like; it is similarly described and figured as long and slender in Mueller's original account of *A. Alexandræ*. But

FIG. 232. STAND of *Archontophœnix Alexandræ* in gulley at Byfield, Queensland, in Parnassus Range.

These trees appear to be more slender than most of those of the same species grown separately in the open; such dissimilarity between palms of thick woods and horticultural subjects is marked in the royals (Roystonea) as well also as in pine trees and oaks.

when we come to the account of the genus Archontophœnix by Drude in Engler and Prantl Die Natürlichen Pflanzenfamilien, 1889, as pointed out by Cook, we find the pistillode described as pyramidal. Cook also calls attention to differences in the fruit as between Drude's diagnosis of Archontophœnix and "the true *Archontophœnix Alexandræ*," this species not having "an adherent endocarp, as stated by Drude," and also apparently a different raphe. Because of these discrepancies, Cook finds that "Drude's later diagnosis seems to have been drawn for a different palm, perhaps the very species grown in California." This may be true; but it does not follow that the differences in pistillodes and fruits are sufficient to warrant the erection of a new genus; they may represent only differences between species. Moreover, these characters, as those of the anthers, are not as clear or as invariable as one would be led to suppose from the published descriptions and comments. The endocarp (inner structure of the pericarp) may be only a loose free bony shell in the mature dried fruit but it may be more or less adherent in unripe or uncured fruits. The exocarp or outer shell is likely soon to disappear after the fruits have lain on the ground.

Considerable material has now accumulated for the study of the king palms. The author has photographed them and secured botanical material from different places in California, Florida, Bermuda, Cuba, Jamaica, Trinidad, Canal Zone, British Guiana, and two places in Brazil, as well as under glass in New York. Specimens have been received from Mauritius, which is one of the Mascarene Islands northeast of Madagascar, and also from the botanic gardens at Singapore. Generous aid in the inquiry has been rendered by C. T. White, F.L.S., Government Botanist of Queensland, who has supplied photographs and specimens from trees there planted and who has also despatched collectors into Queensland to obtain material from the wild; and he has read two drafts (in manuscript) of the present study.

From a study of all this material extending over several years, the writer now considers that the planted palms here mentioned are two species, *Archontophœnix Cunninghamiana* and *A. Alexandræ*, and a botanical variety of the latter. From present evidence one cannot adopt other names. Similar conclusions were reached by Burret in 1928 in his study of the case (Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, x, 306). This important publication by Burret was not known to the writer when he began the study of these Australian palms and had arrived at his decisions.

In coming to this opinion, it should be said that there are many doubts in the identification of these and related palms, but the acceptance of Loroma does not appear to elucidate them, and this segregation has not been accepted in Australia. There may be species in Australia not yet recognized or at least not clearly differentiated. Details in descriptions do not always harmonize, as in the number of pinnæ. Some of the inharmonies

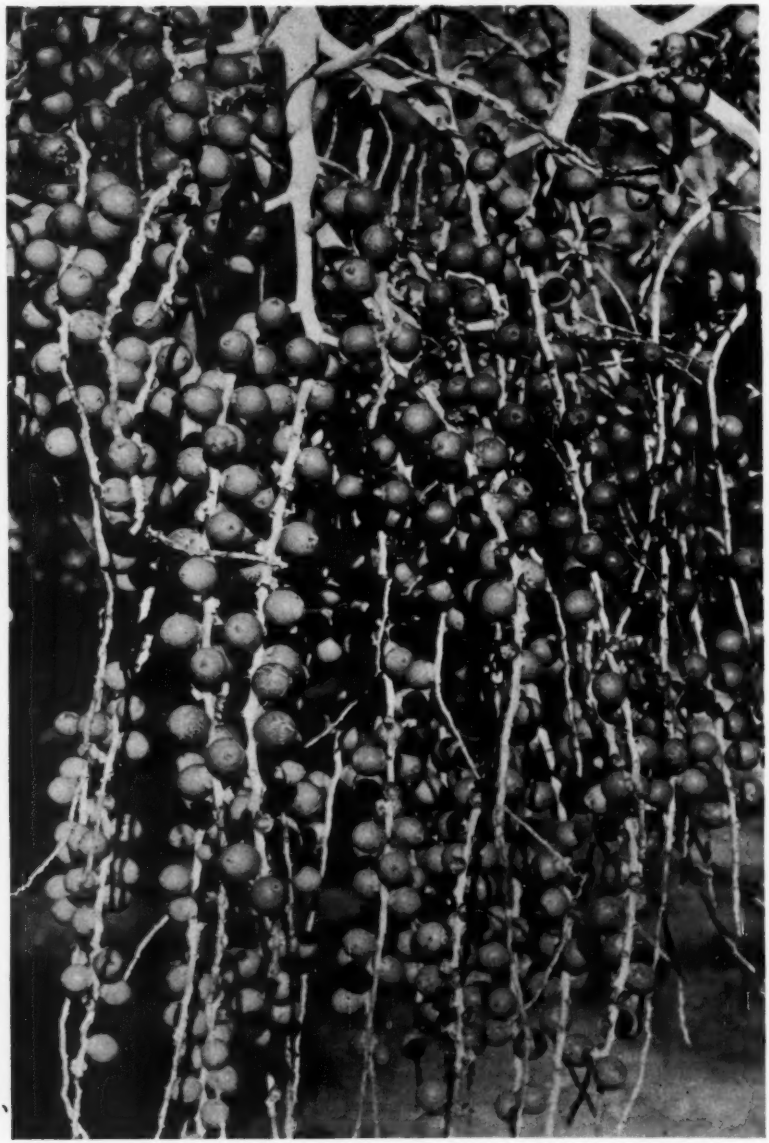


Fig. 233. Fruits of Alexandra palm, *Archontophœnix Alexandræ*, photographed in the Parnassus Range at Byfield in central Queensland. About one-half natural size.

may be plain errors, and this would not be surprising in view of the loose state in which so much of the palm botany rests; in the palm family we must always make ample allowance for such shortcomings. Considering the nature of museum palm material in connection with the fact that so many descriptions have been drawn from cultivated and juvenile plants, one does not wonder that baffling errors abound in the literature. Errors in nomenclature are so common and so widespread that one comes to challenge every palm picture that one sees.

FIG. 234. FLOWERS OF KING PALMS. *a*, *Archontophœnix Alexandræ*, staminate flowers (× 2½), stamen, pistillode, petal (× 5), regular triplet of two staminate buds and a pistillate bud between (× 2½); *b*, *A. Cunninghamiana*, two staminates and a stray pistillate above (× 2½), stamen, petal of staminate flower with pistillode placed on it (× about 5).

Neither do we know how variable the king palms may be. The writer has found marked differences in pistillodes even on the same tree. While the Cunningham palm typically has a thick pistillode much surpassed by the stamens and bearing three rudimentary styles, one sometimes finds it slender and equalling the stamens and with only one or two styles; likewise in the Alexandra palm the pistillode is sometimes only half or less the length of the stamens although it is typically slender and equalling or exceeding them. Trees that have every other mark of the Alexandra palm have the short anthers and relatively long filaments of the Cunningham; there is wide divergence between flowers from the same tree in the number of stamens. Fruits vary considerably, particularly in size. It is easy to say that such cases represent hybrids, but this means nothing; we must first determine whether the species cross. As a subject, variation in palms is all ahead of us.

One is surprised that the color of flowers is not contrasted in standard accounts of the two king palms, for the differences are marked. This is probably because descriptions have been drawn from dried specimens. We have seen that in the first account of the Cunningham palm (in Hooker's description of what he then thought was *Seaforthia elegans*, Bot. Mag. t. 4961) the flowers are described as lilac, the character being taken from the living plant.

The status of the two planted king palms, as at this writing understood, may now be displayed. The technical characters of flowers are drawn from

living examples and also from dried material properly boiled and freshened for examination.

ARCHONTOPHŒNIX, Wendl. & Drude, in Linnaea, xxxix, 182, 211 (1875). King Palms.

Loroma, O. F. Cook, in Journ. Wash. Acad. Sci. v, 117 (1915).

Tall unarmed monœcious trees, with single ringed trunk, large pinnate long-sheathing leaves in the lower axils of which the flower-bud forms, the inflorescence expanding after the fall of the leaf and therefore infrafoliar, the spathe bursting by pressure; pinnæ numerous, arching and drooping or even hanging, often turned edgewise: spathe-valves 2, of similar length, about 4-6 dm. (15-25 inches) and the upper involved in the lower, satin-white inside, one falling in advance of the other: flower-cluster compound,

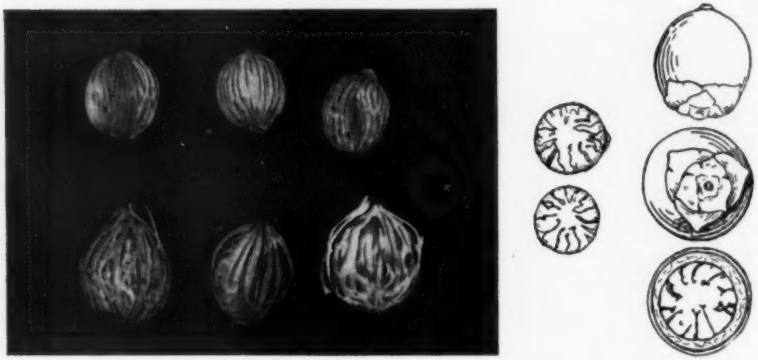


Fig. 235. Seeds with fibers attached of Archontophœnix. Top row, *A. Alexandræ* grown in Queensland, Trinidad, British Guiana respectively. Bottom row, *A. Cunninghamiana* from Queensland, southern Brazil and California in sequence. A trifle over-size.

Drawing at right, two seeds of *A. Alexandræ* in cross-section; three fruits of *A. Cunninghamiana*, side and bottom view, cross-section. (× 1½). The sections show the ruminate albumen.

much branched from the apex of a short stout peduncle, the numerous strands at first hanging and 45-75 cm. long, later becoming more open from the elevation of the main forks or branches which at first are white and more or less succulent; flowers lilac or white, irregularly spirally placed, typically in 3's and the middle one pistillate, but often irregular because of the abortion or aggregation of some of them; staminate flowers 3-angled when closed, successively expanding in advance of the pistillate flowers, bearing 8-24 stamens and a pistillode, anthers versatile and dorsifixed, the 3-keeled sepals small and obtuse and imbricated, the 3 petals ovate to oblong and subacute and valvate; pistillate flowers much smaller and more or less rounded, sitting in a calyx-like cupule of bracts, calyx and corolla imbricated and of similar length, stigmas but not the perianth expanding at anthesis, sometimes bearing staminodes, the perianth accrescent after anthesis; ovary more or less 3-angled, 1-celled, with 3 stigmas: fruit 1-

seeded, globose-oblong or ellipsoid, 1½ cm. or less long, coral-pink or red at maturity, the exocarp soft but becoming thin and readily separating when dry and exposing a layer or covering of strong longitudinal fibers; seed erect or nearly so, not furrowed (and thus differing from the fruit of Ptychosperma), raphe a band of loose or embedded fibers, albumen prominently ruminate.

Forest palms in tropical and subtropical eastern Australia.

In cultivation in the open these palms appear to assume characters of bole they do not possess in native forests. They yield well to cultivation. Cowlishaw, in his booklet (Sydney, 1929) "All About Palms," states that "a rich loam on the sandy side suits them best, and plenty of well-rotted manure is also appreciated when the plants are established and in full growth. They attain a great height, 80 feet or more being common. The

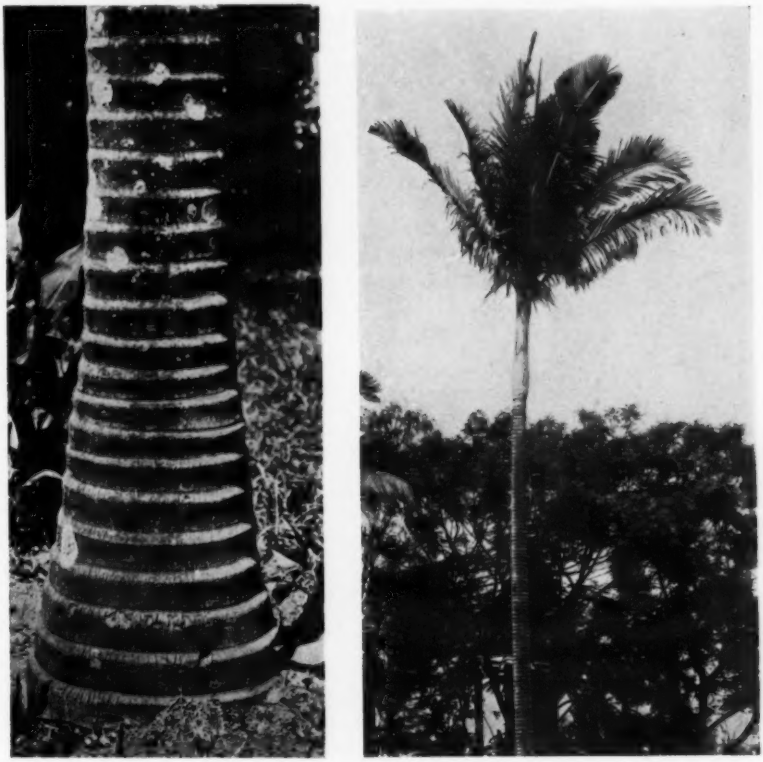


FIG. 236. BEATRICE OR STEP PALM, *Archontophœnix Alexandræ* var. *Beatricæ*, in Queensland.

plants are propagated by seeds." Mowry recommends both species for cultivation in southern Florida (Bulls. 184, 228, Fla. Exp. Sta. 1926, 1931). They thrive in parts of southern California, near the coast. The wide adaptability of the genus is indicated by the commendation given *A. Alexandræ* by J. F. Rock in his "Ornamental Trees of Hawaii," pages 13 and 47, t. XX, and by E. H. Walker for south China in Science Bulletin No. 1 of Lingnan University, 43 (1930); as well as by publications on other countries.

FIG. 237. HEADS OF BEATRICE OR STEP PALM, *Archontophœnix Alexandræ* VAR. *Beatricæ*, in California.

Pinnæ very broad (often 5-10 cm. below tip of leaf), green underneath (or not gray-glaucous) and somewhat chaffy, without prominent secondary ribs: flowers lilac: fibers over seed coarse and loose.....*A. Cunninghamiana*
Pinnæ mostly narrower, glaucous-white and not chaffy underneath, with prominent secondary ribs: flowers white or cream-color: fibers over seed slender and tight.
Lower leaves conspicuously drooping: bole not prominently indented. *A. Alexandræ*
Lower leaves of head ascending: bole strongly indented or stepped. Var. *Beatriceæ*

Archontophœnix Cunninghamiana, Wendl. & Drude, in Linnaea, xxxix, 214 (1875); Domin, in Biblioth. Bot. xx, 498 (1915). PICCABEEN OR CUNNINGHAM PALM. Figs. 227, 228, 229, 230, 231, 234, 235, 238.

Seaforthia elegans, Hook. in Bot. Mag. t. 4961 (excl. ff. 9, 10, 11), not R. Br. (1857).

Ptychosperma Cunninghamiana, Wendl. in Bot. Zeit. xvi, 346 (1858).

Jessenia amazonum, Drude, in Martius, Fl. Bras. iii, pt. ii, 474 t. 109 (1882).

Seaforthia Cunninghamii, Hort. ex F. M. Bailey, Compreh. Cat. Queensl. Plants, 373 (1909).

Loroma amethystina, O. F. Cook, in Journ. Wash. Acad. Sci. v, 118 (1915).

Loroma Cunninghamiana, O. F. Cook, l.c.

Tree 18-22 m., trunk not enlarged, or not prominently so, toward base: pinnæ green underneath with secondary nerves not very prominent, the large ones near the central part of the leaf 5-10 cm. broad at the middle, bearing more or less chaffy scales on midrib underneath: flowers in the lavender or lilac series; staminate about 4-6 mm. long before anthesis, not acuminate and often scarcely acute, stamens 12-16, anthers about 2½ mm. long, slightly fragrant in anthesis; pistillode about one-half length of stamens (but sometimes as long as they), rather stout and usually with 2 or 3 rudimentary styles or stigmas: fruit about 1½ cm. long, the fibers that are exposed by the decay of the exocarp strong and loose and needle-like at the apex; raphe sunken.

The Piccabeen palm of Australia; has been sold in this country as the Illawarra palm. Native in Queensland, with extension of apparently the same species into New South Wales where it is known as Bangalow palm. It is confined mostly to the subtropics, or to mountain regions in the tropics.

Archontophœnix Alexandræ, Wendl. & Drude, in Linnaea, xxxix, 212 (1875). ALEXANDRA PALM. Figs. 229, 232, 233, 234, 235.

Ptychosperma Alexandræ, F. Muell., Fragm. Phyt. v, 47, t. 43, 44 (1865-66).

Jessenia Glazioviana, Dammer, in Engl. Bot. Jahrb. xxxi, Beibl. lxx, 21 (1902).

Reported as becoming taller than *A. Cunninghamiana* ("ultra 100′ alta," Van Houtte in Flore des Serres, t. 1916), the trunk enlarging toward

and at the base: pinnæ prominently whitish or ash-colored underneath, the side nerves heavy and very prominent beneath so that the parts have a ridgy look, 3-5 cm. broad at the middle of the larger ones: flowers white or cream; staminate 6-8 mm. long before expanding, strongly angled, acuminate, anthers 3½-4 mm. long, linear; pistillode a slender filament equalling or exceeding the stamens and sometimes with rudimentary stigmas (but in some cases less developed and only half or less as long): fruit 1¼ cm. or less long, the exposed fibers slender and not prominently loosening; raphe slender and hardly adherent.

Queensland; a more tropical palm in Australia than *A. Cunninghamiana* although it appears to thrive equally with that species in southern Cali-

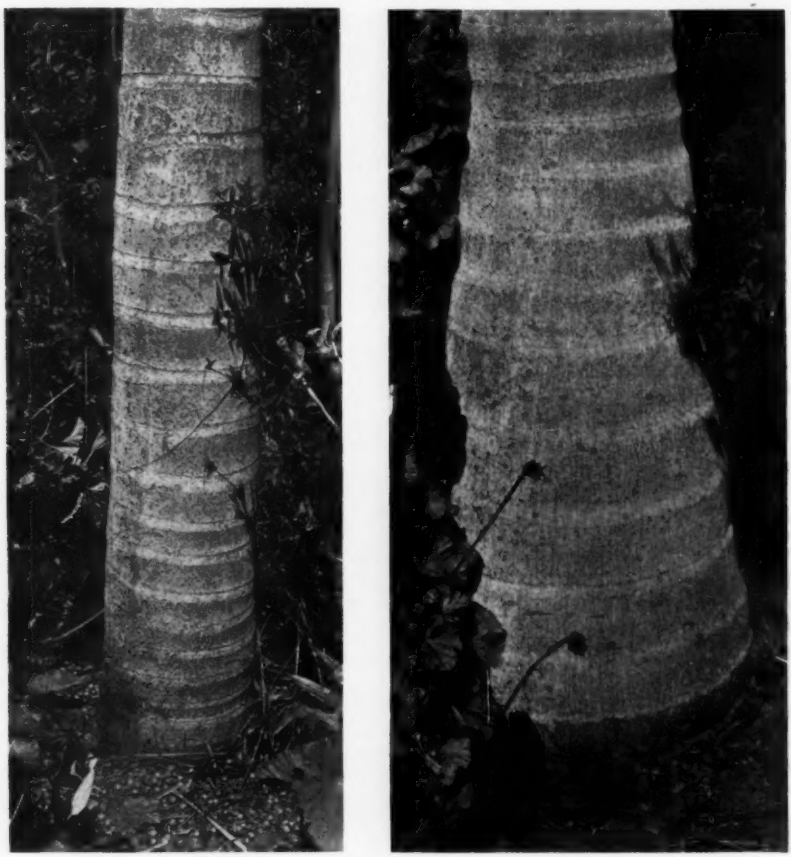


FIG. 238. BASE OF BOLE of two kinds of Archontophœnix as grown in California. *A. Cunninghamiana* at left, *A. Alexandræ* var. *Beatricæ* at right.

fornia and Florida. In writing of the rain forest of the Eungella Range in Queensland, W. D. Francis states that "In the valleys there were large numbers of the Northern Bangalow palm (*Archontophœnix Alexandræ*), which is similar in appearance to the Bangalow palm (*Archontophœnix Cunninghamii*), which extends much farther south"; and again: "Very large numbers of the Bangalow palms (*Archontophœnix Cunninghamii*) were also found along the track to Mt. Dalrymple at about 3,000 ft. In places these palms were the predominant constituent of the forest. The Northern Bangalow palm (*Archontophœnix Alexandræ*) appeared to be comparatively rare in the upper parts of the range" (Proc. Royal Soc. Queensl. xxxix, 109, 110, 1928). Type locality, Fitzroy's River, Queensland.

† **A. Alexandræ** var. **Beatricæ,** C. T. White, in litt., status novus. BEATRICE or STEP PALM. Figs. 228, 236, 237, 238.

Ptychosperma Beatricæ, F. Muell. in Chemist and Druggist, Feb. 1882.

A. Beatriceæ, F. M. Bailey, Queensl. Fl. v, 1675 (1902).

A Beatricæ, F. M. Bailey, Compreh. Cat. Queensl. Pl. 573 (1909).

Bole stout, soft in texture, prominently enlarged at base, the rings very pronounced and often looking like steps: leaf-crown having ascending or cuneate base rather than hanging fronds, in this respect suggesting var. *excelsior* of *Roystonea oleracea* (Fasc. vii, Fig. 204).

Northern Queensland; sometimes seen in cultivation.

ARTICLE 9. CERTAIN PTYCHOSPERMATE PALMS OF HORTICULTURISTS

BEING THE CASES OF SEAFORTHIA AND SOME OF ITS RELATIVES THAT ARE PLANTED OR LISTED IN AMERICA AND ARE CONFUSED IN IDENTITY OR NAME.

We have seen in Article 8 that the name *Seaforthia elegans* has been applied to the Cunningham king palm as a result of misidentification in 1857, and that the error persists to this day in spite of many authentic corrections. We must now inquire about the plant originally entitled to be called *Seaforthia elegans* and shall find it to be a palm very different from the other; and we shall then learn that the name Seaforthia is to be dropped from both classes of palms. We have here an entertaining example of how

FIG. 239. FLOWER AND PARTS of *Ptychosperma elegans*, often erroneously grown as *Hydriastele Wendlandiana*; staminate flower with pistillode showing in center and detached petal with adhering stamens (× 3); two stamens, pistillode and petal (× about 5).

such things come to pass in the long and devious history of horticulture and descriptive botany. The confusion in nomenclature runs through the literature in many parts of the world, even in Australia. The common species was well pictured by Beccari as early as 1885 in Buitenzorg, Java.

The name Seaforthia originates with Robert Brown, one of the profoundest of botanists, in his flora of New Holland and Van-Dieman Island (that is, of Australia and Tasmania) in 1810. It is one of the many results of his journey to that far place in the years 1802-5. The account of Seaforthia is naturally not sufficient to satisfy the critical requirements of the present day, but the palms of his original localities are now fairly well understood, and it is hoped we can properly establish the generic lines. The perfectly natural error in identification of Seaforthia by the first Hooker in 1857 (when palms were imperfectly understood) was corrected by the second Hooker in 1894 and the plant figured and described in the latter

year (Bot. Mag. t. 7345) is now accepted as the palm intended by Brown. In Brown's nomenclature the plant bears the name of Lord Seaforth.

Robert Brown was not aware that in the previous year (1809) the Frenchman Labillardière had founded the genus Ptychosperma to accomodate a palm from the Pacific island New Ireland, northeast of New Guinea (Bismarck Archipelago), later renamed Neumecklenburg and now known by its former title. The palm of Labillardière was described as *Ptychosperma gracilis*. When new palms were discovered in Polynesia and Malaya, some of them were named in Seaforthia and some in Ptychosperma. As the groups became better understood, however, it was decided that the two generic names really represent the same group of plants and the older one, Ptychosperma, must hold; so it came that Seaforthia was reduced to synonymy.

When the palms of Oceanica became better known and more critical study was applied, it was found that Ptychosperma comprised many inconsistencies; at present it has been purged of most of the heterogeneous elements by the establishment of new or segregated genera, and relatively few species are now retained in it. Recently it has been suggested that Seaforthia is really generically separable from the Ptychospermas. For the settlement of this and similar problems, a careful study of the entire group is required, far exceeding the scope of the present paper. Moreover, these questions were critically reviewed only recently by Dr. Max Burret of Berlin-Dahlem (Beiträge zur Kenntniss der Palmen vom Malesia, Papua und der Südsee, in Fedde, Repertorium, xxiv, 253-296, 1928).

One or more species in the genera discussed in the present Fascicle have been named in either or both Ptychosperma or Seaforthia (excepting Adonidia detached from Normanbya which itself was once included in Ptychosperma), as the synonymies disclose, although it does not follow that the eight groups constitute a closely related sequence. Altogether, more than eighty Ptychosperma binomials are in the literature; very many of them are now placed in Pinanga, and others have followed divergent routes in nomenclature. It is not to be expected that we know the palms of the vast Oceanic region well enough to have arrived at the end of the uncertainties.

The Ptychospermate palms are small or medium trees, sometimes bush-like, with slender ringed trunks, leaves pinnate or pinnatisect and relatively few in a crown, florescence infrafoliar (below the leaves) at the base of a more or less pronounced crownshaft, flowers normally in 3's on soft or fleshy rachillæ, the central flower pistillate and two outer ones elongated in bud and staminate but placement often becoming irregular, fruits drupe-like more or less fleshy single-seeded bodies prevailingly red at maturity and the size of small plums or cherries or even less. They are adapted only to the warmest parts of the United States.

There has been confusion, also, with the genus Drymophlœus, established by Zippel in 1829 (Flora, i, 185; Alg. Konst. en Letterbode, i, 297). From Ptychosperma this genus is distinguished at once by the equable albumen of the seed. From Drymophlœus Beccari separated Actinophlœus, the former bearing an esulcate seed and short or broad pinnæ, the latter with deeply 5-sulcate seed and elongated mostly narrow pinnæ. As now defined, the species of Drymophlœus are few, in New Guinea. None of the species appears to be in regular cultivation in America unless in botanic gardens, the plant sometimes named in the genus being Normanbya.

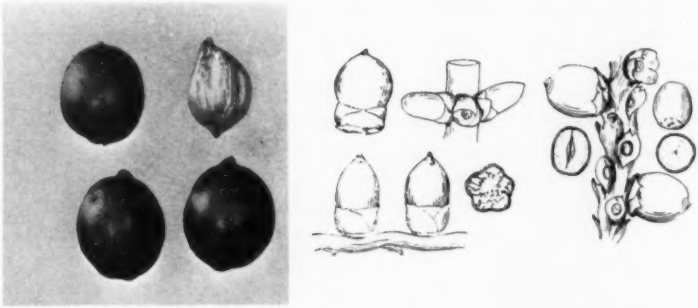


FIG. 240. DETAILS IN FRUITS AND FLOWERS of *Ptychosperma elegans* (left and center) and of *Rhopalostylis sapida* (right). Three drupes and a seed, full size, of Ptychosperma; three fruits in the cupule or accrescent perianth, somewhat reduced; cross-section of seed showing ruminate albumen; two staminate flowers in bud and a pistillate between in upper right corner. Fruits of *Rhopalostylis sapida*, nearly natural size, at right: upper left and lower right, mature fruits in place; upper right, side view of seed; cross-section on right and longitudinal section on left of axis.

Characters of separation in the Ptychospermate genera lie particularly in the mature seeds. In fact, seed and fruit characters are of prime importance in the understanding of most groups of palms. One of the first lessons for the palm grower to learn in identification is the visible character of the albumen, which is the hard white or whitish often flinty content of the seed. Growers often raise their plants from seeds. If a mature seed is cut across it may be found that the contour of the albumen is exactly that of the seed-coat; that is, it is *plain*, *equable* or *homogeneous*. Or it may be found that the albumen is irregular in outline because irregular divisions or growths run far into it, in which case it is *ruminate*. These differences in the albumen are usually characteristic of genera; they are easily observed. This contrast in the albumen is perhaps the quickest and simplest way to distinguish Coccothrinax from Thrinax, for example, as illustrated in this volume of Gentes Herbarum, Fig. 14; and the pictures herewith (Figs. 240, 244, 253, 254) explain the case for the palms now under consideration.

In the Ptychosperma-like palms one must be prepared for the shrinking of the branchlets (rachillæ) of the spadix or inflorescence when they are dried for herbarium specimens. Rachillæ, for example, of *Ptychosperma elegans* (mistakenly grown as *Balaka Seemanni*) that measured 5 mm. in thickness in the fresh state reduced themselves to 2 mm. when pressed and dried, resulting in a very different appearance; such shrinkage has led to confusion in diagnosis.

CERTAIN PTYCHOSPERMATE PALMS OFTEN CONFUSED BY THE CULTIVATOR

A. The small-fruited group, the mature fresh drupe not much if any over 1 cm. (⅓-½ inch) broad, and mostly not greatly if any longer.
  B. Seed containing conspicuously ruminate albumen (as shown in section), narrow divisions of a different color being irregularly projected into it (not to be confounded with albumen that merely conforms to the contour of angled or sulcate seeds).
    C. Pinnæ long-attenuate to a point and not clustered on the rachis: fruit cherry-like, not attenuate; seed not sulcate. . . . . ARCHONTOPHŒNIX (sufficiently disclosed in the preceding part, Article 8).
    CC. Pinnæ, or some of them on each leaf, broad and premorse or jagged or erose at end, irregularly placed on the rachis and perhaps two or more at one insertion: fruit either obtuse or apiculate; seed strongly sulcate or furrowed. . . . . PTYCHOSPERMA, page 413
  BB. Seed with plain (equable) or homogeneous albumen, even when it conforms to external lobes or grooves of seed.
    C. Stamens (in staminate flowers) many: fruit either gradually or abruptly narrowed to apex.
      D. Mature seed strongly sulcate or furrowed. . . . . ACTINOPHLŒUS, page 417
      DD. Mature seed not sulcate: plant slender and reed-like. . . BALAKA, page 426
    CC. Stamens 6: seed perhaps ribbed with fibers but not sulcate or furrowed: fruit rounded, blunt, or apiculate.
      D. Pinnæ or segments broad and premorse or erose at end. . . . . HYDRIASTELE, page 427
      DD. Pinnæ long-acuminate, not erose. . . . . RHOPALOSTYLIS, page 429
AA. The large-fruited group, the cartridge-shaped drupe usually as much as 2½ cm. (1 inch) in transverse diameter and of greater length; seed bearing ruminate albumen, but not sulcate.
  B. Pinnæ attenuate to point or to 2 short teeth, margins strongly costate: fruit 3.5 cm. (nearly 1½ inches) or less long, with thin continuous shell when dry; seed oblong, with checkered coat. . . . . ADONIDIA, page 435
  BB. Pinnæ (or most of them) not attenuate, with broad jagged or erose end and without costate margins: fruit nearly or quite 5 cm. (nearly 2 inches) long, with cross-ridged or wrinkled hard shell; seed nearly globular, rough-reticulate. . . . . NORMANBYA, page 435

PTYCHOSPERMA, Labillardière, in Mem. de la Classe des Sci. Math. et Phys. de l'Institut de France, Ann. 1808 (1809), 252.
Seaforthia, R. Br. Prodr. Fl. Nov. Holl. 267 (1810).

Slender erect mostly small palms with ringed often cane-like trunks, graceful pinnate or pinnatisect leaves with pinnæ or segments truncate or oblique at end and variously jagged or erose, upper segments often confluent: spadices or flower-clusters on the trunk just below the leaf-crown, issuing from 2 deciduous spathes, variously branched and usually compound with the central axis not strongly continuing throughout: flowers spirally disposed on the more or less fleshy rachillæ, typically in 3's, the middle one conic in anthesis and pistillate, two lateral ones narrow-oblong in bud and with 20-30 stamens and usually a central pistillode: fruit drupe-like, mostly red at maturity, small, ovoid or ellipsoid, apiculate or

FIG. 241. THE FIRST PICTURE of *Kentia Macarthuri*, now known as *Actinophlæus Macarthuri*, by Veitch and reproduced in 1879 in Florist & Pomologist and in Illustrierte Garten-Zeitung. Note the elongated pinnæ with nearly parallel sides, some of them very broad, and the ragged ends.

narrowed at apex, the flesh thin and soon drying over the hard seed, sitting in the enlarged calyx cupule; seed single, strongly sulcate lengthwise, albumen prominently ruminate at least about its periphery.

The word Ptychosperma, *folded seed*, is a Greek neuter although it was employed by its author and by most subsequent writers as feminine. Burret recently writes the species in neuter form, which is according to rule and also in harmony with usage in Dictyosperma and Didymosperma, other palm genera.

Species 13-15, as admitted by Burret in his synopsis of 1928 (in Fedde, Repertorium, xxiv, 263-270), in Australia, New Guinea and New Ireland; and he has recently added another species, *P. salomonensis*, from the Solomon Islands (Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xii, 45, 1934). In the present instance we are interested in only the Australian species; these appear to be three, two of them from Queensland and *P. Bleeseri*, Burret, from North Australia (see p. 424). In the present account the author is under special obligation to Mr. C. T. White, Government Botanist, for specimens and liberal notes; also for copy of his manuscript of an article on the Ptychospermas of Queensland to be published in the Proceedings of the Royal Society of Queensland and the conclusions of which have been largely followed in this presentation, particularly in respect to *P. Capitis Yorkii*.

Before discussing these species it is necessary to review the geography of northeastern and northern Australia. The continent of Australia is deeply indented on the north by the great Gulf of Carpenteria. The narrow pointed region on its eastern side, between the Gulf and the Pacific Ocean, is Cape York Peninsula, comprising the northern extension of the state of Queensland, reaching nearly to 10 degrees south latitude and approaching New Guinea. From this peninsula come the plants described as *Ptychosperma Capitis Yorkii*, *P. Jardinei*, and *P. Wendlandiana*. To the west of the Gulf lies the territory of North Australia, on the upper northwestern corner of which is Port Darwin, whence comes *Ptychosperma Bleeseri*. From North Australia also came the original collection of the plant known as Hydriastele. Probably from the east-central coastal region of Queensland were procured the original collections of Seaforthia (*Ptychosperma elegans*), between Sandy Cape and Cumberland Islands, south latitude about 25-30 degrees; the species has now been collected part way up the Cape York peninsula as well as in central Queensland.

Pinnæ prevailingly broad on well grown leaves, some or all mostly 5-8 cm. or more (2-3 inches or more) across ..... *P. elegans*
Pinnæ very narrow throughout, 2-3 cm. broad, or perhaps to 4 cm. (¾-1½ inches) ..... *P. Capitis Yorkii*

Ptychosperma elegans, Blume, Rumphia, ii, 118 (1843), in obs. Figs. 239, 240.

Seaforthia elegans, R. Br. Prodr. Fl. Nov. Holl. 267 (1810).

Ptychosperma Seaforthia, Miq. Fl. Ind. Bat. iii, 21 (1855).—*Seaforthia Ptychosperma,* Martius, Hist. Nat. Palm. iii, 182, tt. 128, 129 (1837-8) is the original *Ptychosperma gracile* of Labill.

Archontophœnix elegans, Rock, Ornam. Trees Hawaii, 47 (1917), as to name.

Small or medium palm of neat and attractive appearance, with solitary slender erect ringed trunk to 7 m. (20 feet) and 7-10 cm. (3 or 4 inches) in diameter, enlarged at base, wood very hard: leaves 6-8, upper ones erect-arching, lower ones horizontal-drooping, forming a loose open small head, the long close sheaths making a crownshaft below which the flowers are borne; petiole short on old bearing plants, concave on upper side; blade 3 feet or more long, bright green but mostly lighter colored underneath, glabrous, with 20 or more irregular closely placed pinnæ on either side the rachis; pinnæ pointing forward, sessile, narrowed toward base, to 8 dm. (32 inches) long, breadth of main ones on full grown leaves mostly 5-9 cm. or even to 11 cm. (2-3½ or more inches) near middle but intermediate ones sometimes narrower, somewhat narrowed above middle but apex diagonal or strongly oblique to irregularly truncate and variously laciniate or erose, with conspicuous midrib and strong intermediate and marginal ribs or nerves: spathes 3-5 dm. (12 inches or more) long; spadix (inflorescence) a bushy glabrous clump well below the crown, main axis short and flattened and soon breaking into many angled branches, the ultimate rachillæ nearly or quite terete and 4-5 mm. thick when living, bearing the flowers typically in 3's but in fact often scattered or irregular, the staminate opening first: flowers white, as in Fig. 239: fruit bright red at maturity, usually ovoid-pointed or cartridge-shaped, the short-oblong drupe 14-18 mm. long by 12-14 mm. broad (as much as ¾ inch long), but sometimes nearly globular and apiculate (var. *sphærocarpum,* Becc.), flesh soft and thin; seed nearly or quite length of the drupe, more or less irregularly 5-sulcate, often lop-sided, albumen prominently ruminate.

Central and eastern Queensland north of 25 degrees south latitude, in rather light rain forests. Widely distributed as a cultivated plant, often under the name *Hydriastele Wendlandiana;* sometimes grown mistakenly as *Balaka Seemanni;* the writer has material from southern Florida, Jamaica, Canal Zone, Trinidad, Venezuela, Demerara, Rio de Janeiro, Singapore, as well as native specimens from Queensland.

Ptychosperma Capitis Yorkii, Wendl. & Drude, in Linnaea, xxxix, 217 (1875).

Kentia Wendlandiana, Benth. Fl. Austral. vii, 138 (1878) in part, not F. Muell.

Archontophœnix Jardinei, F. M. Bailey, in Queensl. Agr. Journ. xi, 129 (1898).

Ptychosperma Jardinei, F. M. Bailey, l. c., xxiii, 35 (1909).

Ptychosperma Wendlandianum, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, x, 205 (1927); in Fedde, Repert. xxiv, 264 (1928).

Differs from *P. elegans* in the much narrower pinnæ, apparently less strongly nerved.

Somerset, Upper Cape York Peninsula, Queensland.

In a part of the type collection of *Archontophœnix Jardinei* by F. L. Jardine, in the writer's collection, the pinnæ are about 3 cm. broad and apparently thinner and of less substance than those of *P. elegans;* fruit is small, only about 11 mm. long. C. T. White finds the width of pinnæ in his material to be 2-4 cm. Whether this northern plant is one of the variants of *P. elegans* cannot yet be stated. One cannot make definite comparisons in width of pinnæ without knowing from what part of the leaf the pinnæ are taken. The plant is confused in F. M. Bailey's Flora of Queensland. Apparently this Ptychosperma has been distributed in the tropics as *Hydriastele Wendlandiana* (which see, page 427).

Doubt has been raised (Burret in Fedde, Repertorium, xxiv, 266 note) whether *Ptychosperma Capitis Yorkii* may not be an Actinophlœus, seeds not being in evidence, and Burret makes a binomial under that genus. The species was described from Cape York. Material from that locality in the author's herbarium collected by F. M. Bailey, has good seeds, which are clearly Ptychosperma.

The binomial *Ptychosperma angustifolium* is applied in cultivation to plants that prove to be species of Actinophlœus. The true *Ptychosperma angustifolium* of Blume is not known to the writer to be in cultivation in the western hemisphere; this palm is now known as *Coleospadix angustifolius*, Burret in Fedde, Repertorium, xxiv, 286 note (1928), of which *C. oninensis*, Becc. is a synonym; the species, however, requires further study from native materials. Some of the *P. angustifolium* and *Coleospadix oninensis* in cultivation is an undetermined Actinophlœus, and others are *A. Macarthuri*. The Beccarian genus Coleospadix, of two or three species in New Guinea and Molucca, is distinguished by a nonsulcate fruit with ruminate albumen, as well as a long-peduncled spadix sheathed by persistent spathes.

ACTINOPHLŒUS, Becc. in Ann. Jard. Bot. Buitenzorg, ii, 126 (1885).
Drymophlœus subgen. *Actynophlœus*, Becc. in Malesia, i, 42 (1877).
Drymophlœus § *Actinophlœus*, Hook. f. in Benth. & Hook. Gen. Plant. iii, 893 (1883).

This genus is marked by pinnate leaves with elongated more or less erose or truncate apex of segments or pinnæ, deeply 5-sulcate seed and equable (non-ruminate) albumen. *Actinophlœus*: name apparently from Greek for *ray* and *bark*, but derivation and application not stated by its author.

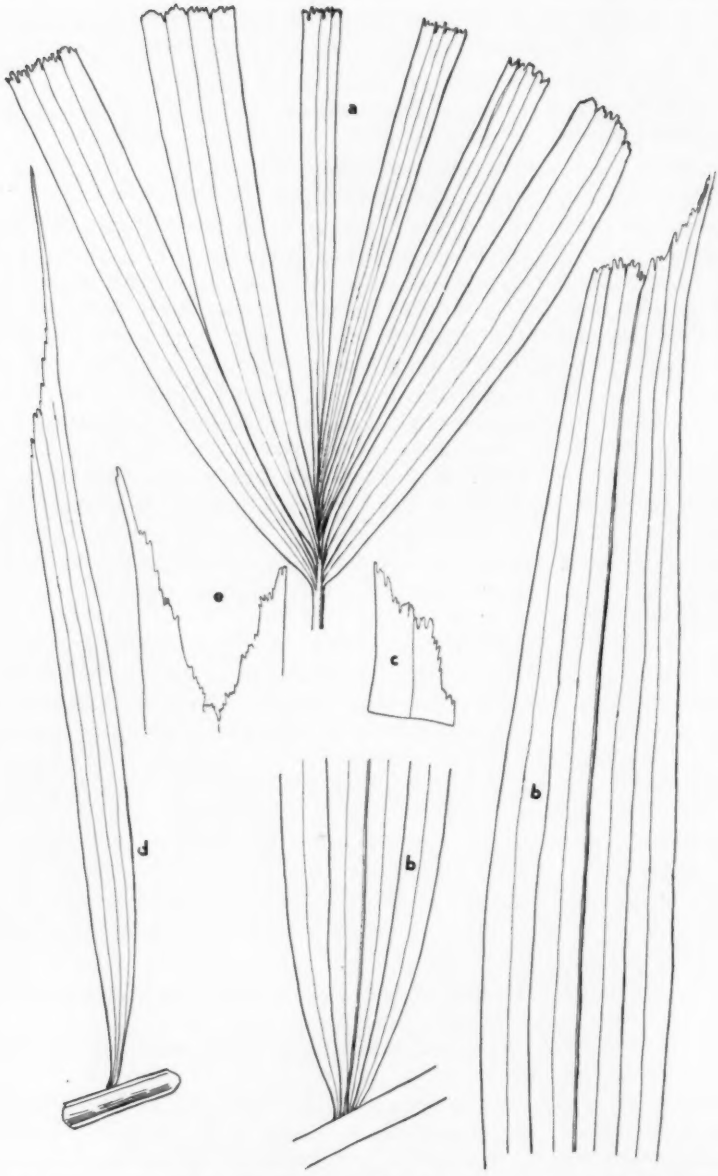


Fig. 242. Pinnæ of Macarthur palm, one-third natural size, from Buitenzorg Botanic Garden in Java, *Actinophœus Macarthuri*. *a*, tip of leaf; *bb*, central pinna (in two parts) from same leaf; *c*, another form of tip from this leaf; *d*, pinna from lower part of same leaf; *e*, another form of tip on central pinna on a leaf of another plant.

A dozen regularly accepted species of Actinophlœus are recognized from New Guinea and adjacent islands, of which only *A. Macarthuri* has been listed in general cultivation. We are now to find, however, that the case is not as simple as this.

Although Actinophlœus was separated from Drymophlœus by Beccari as early as 1885 in a very brief statement of differences, the genus as a whole has not yet been fully characterized. The account of Radermacher in 1926 was a full description of *Actinophlœus Macarthuri* rather than of the genus, six trees of this species in the Botanic Garden at Buitenzorg, Java, having been cited as evidence. The species are yet so little understood that the genus can hardly be comprehensively described. It is sufficient for our purposes to say that Actinophlœus comprises small slender-stemmed

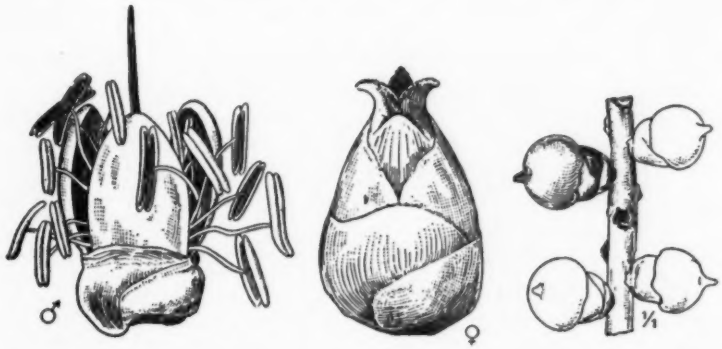


FIG. 243. FLOWERS AND FRUITS OF THE MACARTHUR PALM, *Actinophlœus Macarthuri*, from Arnold Radermacher in Annales du Jardin Botanique de Buitenzorg, 1926. Flowers (× about 5) comprising a staminate with projecting pistillode, and a pistillate; fruit natural size.

unarmed monœcious palms, with annular trunks (one or more to a plant) that probably do not much exceed some 25 or 30 feet in height, pinnate graceful out-curving leaves bearing pinnæ regularly or irregularly placed on the rachis and mostly with broad obtuse truncate or obliquely jagged ends and one or two projecting points or fingers from the apex of the main or central ones, a long prominent petiolar sheath that bears two projections from the apex, simple or branched inflorescences standing below the leaves and 30-70 cm. long, staminate flowers capsule-shaped in mature bud and bearing many stamens, 2 narrow spathes 20-40 cm. long, fruit cartridge-pointed and carried in an enlarged calyx or cupule and 20 mm. or less long, red at maturity, deeply 5-sulcate, the albumen in cross-section homogeneous within its conformation (not ruminate by narrow intrusions running into it or through it).

How many species of Actinophlœus are in active cultivation is not yet known. Pieces that apparently represent other species than *A. Macarthuri* are in the author's collection, awaiting more material; the present report, therefore, is only partial.

The author hopes to be able to make further report on the planted *Actinophlœus Macarthuri* associates, if sufficient material accumulates from different sources. Good photographs of the living plant should be taken whenever possible, together with complete leaf including basal sheath (all cut and pressed in proper pieces for herbarium specimens), flowers, fully ripe fruits; and the spathe, in two parts or valves, is easily obtained.

The technical characterization of *A. Macarthuri* in this paper is based on the account by Radermacher together with studies of much material of the cultivated plant. The author is the fortunate possessor of complete specimens of leaves, flowers and fruits from the six trees of Radermacher at Buitenzorg and from eleven other trees from that Botanic Garden.

Actinophlœus Macarthuri, Becc. in Webbia, iv, 154 (1913); Radermacher, in Ann. Jard. Bot. Buitenzorg, xxxiv, 12 (1926); Hubbard & Rehder, in Harvard Univ. Bot. Mus. Leaflets, i, 1-2 (1932). Macarthur Palm. Figs. 241, 242, 243, 244.

Kentia Macarthuri, Wendl. apud T. Moore, in Florist and Pomologist, 1879, 114 and fig. See Fig. 241.

Ptychosperma Macarthuri [Wendl.], Nichols. Ill. Dict. Gard. iii, 248 (1886).

Slender palm, commonly cespitose with as many as 20 stems but rarely with only one; stems or caudices smooth and glabrous, gray or greenish-gray, 7-8 m. tall and about 8 cm. in diameter, internodes at base about 12-16 cm. long and at apex very short: leaves alternate, 7 or 8 present at the same time, long-sheathing, the sheaths 30-60 cm. long, striate and green outside, smooth and pale inside, apex of the sheath near foot of petiole bearing 2 deltoid projections to 9 cm. long (but often much shorter); petiole 16-40 cm. long, solid, convex underneath, concave above; leaf-blade 1.25-3 m. long and 60-110 cm. broad, pinnate or pinnatisect, the segments or pinnæ 21-30 on either side the rachis but scarcely opposite, glabrous, confluent at apex, at the base longitudinally plicate on the back, carinate above, 30-60 or more cm. long and 4-10 cm. broad, cuneate at base, margins nearly parallel and entire, at apex variously oblique and erose-dentate, one or both margins projected into a point; lateral ribs of pinnæ not so strong or so closely placed as to give the blade a very prominent multicostate appearance: spadix or inflorescence infrafoliar (below the leaves), growing out of an old axil or at this time included in the sheath, pale yellow, flattened: spathes 2, bidentate at apex outside, V-shaped on both sides, superficially split on the inside, interior gladiform (sword-shaped), both deciduous with the leaves; spadices about 6, smaller ones in upper axils, others in lower axils, strongly branched, some of them broadly or narrowly deltoid-bracted at base, up to 30-80 cm. long and usually broader, the rachillæ pendent and green and essentially glabrous: flowers in 3's on the rachillæ, 2 lateral ones

staminate and developing first and deciduous, central one pistillate, sometimes abortive, developing when the staminates are falling: staminate flowers yellowish-green, the 3 calyx-segments imbricate and about ¼ cm. long, inner segments valvate, ½cm. long and exserted, with deltoid apex; stamens many, introrse, inserted on base of petals, white, filaments filiform and 3/10 cm. long, anthers long-oblong and white, dorsifixed, the 2 cells split lengthwise; rudiment of the ovary sterile, glabrous, white, ovoid, hollowed and lobed in center, style white, filiform, 6/10 cm. long and contracted: pistillate flowers yellowish-green, 3/10 cm. long, shortly obpyriform, calyx and corolla segments 3 and imbricate, all glabrous; staminodes lacking; ovary ovoid, white, glabrous, apex of style thick conoid and marked with greenish, 1-celled; ovule 1, parietal: fruit 12-15 mm. long or to 18 or 20 mm. long in cupule, at first green, then yellow, becoming carmine-red, ellipsoidal, apex marked by a thick solid rudimentary style, the fruit deciduous and calyx or cupule persistent; seed 1, sulcate, included in a thick mesocarp that has a slightly acid taste; albumen white, equable.

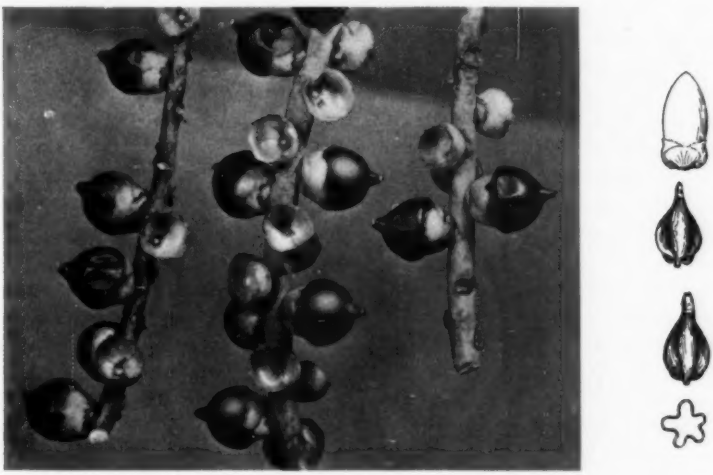


FIG. 244. FRUITS AND OTHER PARTS of *Actinophlœus Macarthuri* from Cuba. Fruits are approximately natural size, most of them now somewhat shrivelled; bright red. Upper right, staminate bud, about thrice natural size; two sulcate seeds seen lengthwise; cross-section of seed, showing equable albumen.

New Guinea, not much reported in native collections, perhaps because the species has not been understood. Frequently planted in southern Florida and the American tropics.

Specimens taken from many trees show considerable variation in foliage and size of inflorescences and somewhat in dimensions of fruits. In the large lot from Buitenzorg the central pinnæ range from 30-60 cm. in length and 4-10 cm. in width; the apices are often markedly different; inflorescences or spadices run from 30-60 cm. in length, but they are rather

uniformly simply branched from the short rachis with the lower branches commonly once-forked; length of mature fruit in calyx runs from 14-20 mm.

One must be prepared to find the pinnæ very irregularly placed along the rachis, rather than uniformly as has been indicated. The observer will find the terminal pinnæ or segments narrow and with squarred or truncate bluntly toothed ends, the main central pinnæ broad and oblique and bearing one or two marginal prongs, the lower pinnæ narrower and with excessively oblique end; these differences are displayed in Fig. 242. To describe pinnæ of *A. Macarthuri* without indicating the part of the leaf from which they come is to invite confusion. From the customary descriptions of Actinophlœus it may be difficult to reconstruct the nature of the leaf.

The nomen *Macarthuri* started as a horticultural name under Kentia. As early as 1877 the plant was exhibited at an Exposition in Liege, Belgium, and it was listed (as *Kentia MacArthuri*) in La Belgique Horticole (xxvii, 241) without description. It does not appear in the extensive lists of palms in Kerchove's Les Palmiers, 1878.

What may be considered the first regular publication of the species within rules of nomenclature was in the Florist and Pomologist, London, August, 1879. Here Thomas Moore transcribed an account from the catalogue of Veitch & Son; this firm had shown the plant "during the past season." Moore reprinted the Veitch illustration, which is engraved somewhat reduced in Fig. 241. The description and picture together give an accurate representation of the palm in its juvenile state; many species have been validated from a much less satisfactory account. The Veitch catalogue states that the plant was named by Wendland, then the standard palm authority; and as *Kentia Macarthuri*, Wendl. we may accept it at the beginning. A similar account and the same picture appeared in Illustrierte Garten-Zeitung for December, 1879. As a nomen, without description or citation, the name appeared as *Ptychosperma Macarthuri*, H. Wendl., in a list in annals of the Buitenzorg gardens in 1885 (ii, 90). As *Ptychosperma Macarthuri* it stands in Nicholson's Illustrated Dictionary of Gardening, in September, 1886, without an authority, although this binomial had appeared, merely as a name and accredited to Wendland, in the Kew Report for 1882 (1884) with the nativity as Australia. In 1909 the binomial *Actinophlæus Macarthuri* appeared, as a nomen, by Beccari, in Bulletin du Department de l'Agriculture aux Indes Néerlandaises. In 1913 the binomial appeared again by Beccari in Webbia, with the citation *Ptychosperma Macarthuri*, Wendl. as a synonym; although we do not know of a strictly formal publication under authority of Wendland, yet under the circumstances we may safely accept this 1913 entry as valid in respect to nomenclature under Actinophlœus. It was not until 1926 that the species was botanically described, this time by Arnold Radermacher in the course of an extensive morphological study of the gametophyte of two palms,

Nipa fruticans and this one, in the Buitenzorg Annales, as cited at the beginning of this account; the name had then been in Beccari's manuscript for about fifteen years.

In the palm house at Kew, England, is an old *Ptychosperma* (*Kentia*) *Macarthuri* of which the origin is lost but which may have been from the early Veitch stock. It matches a specimen so named in the Kew herbarium, 1893. Leaf specimens of the growing Kew tree in the writer's herbarium appear to be the same palm as the authentic specimens from Buitenzorg; and the original Veitch plant of 1879 (Fig. 241) is likewise undoubtedly the same. All these agreements should establish the identity of the species *Macarthuri*.

The account in Florist and Pomologist for 1879, quoted from Veitch, states that the palm came from the neighborhood "of the Katau river, in New Guinea. It was named by Mr. Wendland after our valued correspondent, Sir W. Macarthur, of Camden Park, near Sydney, N. S. W., to whom we are indebted for its introduction."

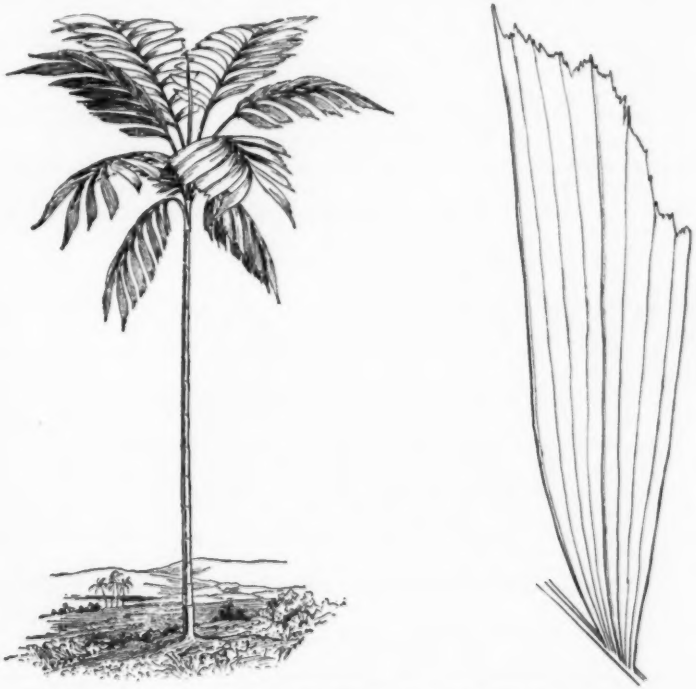


FIG. 245. A FIJIAN PALM, *Balaka Seemanni*; tree adapted from Seemann; a pinna or leaflet, one-half natural size. Page 426.

Here, then, we have example of a plant passing under a definite binomial in cultivation for about fifty years before the name and species found adequate publication.

For the sake of completeness, the other names in Actinophlœus may be appended.

Actinophlœus ambiguus, Burret, in Fedde, Repert. xxiv, 271 (1928). *Drymophlœus ambiguus,* Becc. in Malesia, i, 42, 98 (1877); one of the two types of the genus Actinophlœus, but Beccari in proposing the genus (Ann. Jard. Bot. Buitenzorg, ii, 126) did not make new binomials. See *A. propinquus.*

Northwestern New Guinea at Kapaor (*Beccari*).

A. angustifolius, Hort. may be *Ptychosperma angustifolium,* Blume, in Rumphia, ii, 122, 156 (1843), which is perhaps *Coleospadix angustifolius,* Burret; the cultivated plants received by the writer as *angustifolius,* however, are a true Actinophlœus, very like *A. hospitus.* See page 417.

A. Bleeseri, Burret, in Fedde, Repert. xxiv, 266 note (1928) is *Ptychosperma Bleeseri,* Burret. In a footnote, during printing, to the publication of *Ptychosperma Bleeseri* (1928), Burret questions whether the palm is not an Actinophlœus and makes the binomial *A. Bleeseri,* but fruiting material was unknown. It is evident that determination of the true position of the species must await flowers and fruits. Page 415.

A. Capitis Yorkii, Burret, l.c. is *Ptychosperma Capitis Yorkii,* Burret, to whom fruits were unknown. See page 416.

A. cuneatus, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xi, 205 (1931).

Cultivated Botanic Garden, Buitenzorg, Java; native in New Guinea.

A. furcatus, Becc. in Webbia, i, 302 (1905).

British New Guinea, 200 meters.

A. Guppyanus, Becc. in Webbia, iv. 264 (1914) is *Ptychococcus Guppyanus,* Burret, in Fedde, Repert. xxiv, 273 (1928).

A. hospitus, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xi, 206 (1931).

Cultivated in Botanic Garden, Buitenzorg, Java.

Probably *A. hospitus* is planted in the western hemisphere. It has pinnæ 2-4 cm. broad and mostly 30 cm. or less long, regularly disposed on the rachis, apex premorse, the leaf itself ending in a filum or thread: fruit 14 mm. long: spadix 2-ramose.

A. Kerstenianus, Burret, in Fedde, Repert. xxiv, 263, 271 note (1928) is *Kentia Kersteniana,* Sander, the generic position not yet certain.

A. keyensis, Burret, l.c. 271.

Drymophlœus propinquus, Becc. var. *keiensis,* Becc. in Malesia, i, 44 (1877).

New Guinea (*Beccari*).

Differs from the species in being more slender, pinnæ nearly regularly disposed, and in other characters.

A. Kraemerianus, Becc. in Engl. Bot. Jahrb. lii, 30 (1914) is *Ptychococcus Kramerianus,* Burret, in Fedde, Repert, xxiv, 273 (1928).

A. linearis, Burret, in Journ. Arnold Arb. xii, 268 (1931).
British New Guinea, on Lower Mori River (*L. J. Brass* 1566).

A. macrospadix, Burret, in Notizblatt Bot. Gart. u. Mus. Berlin-Dahlem, xii, 343 (1935).
British New Guinea, at Kubuna, Central Division, 100 meters (*L. J. Brass* 5628).

A. microcarpus, Burret, in Journ. Arnold Arb. xii, 267 (1931).
British New Guinea, Loloki River (*L. J. Brass* 1659).

A. montanus, Burret, in Fedde, Repert. xxiv, 272 (1928).
Drymophlœus montanus, Laut. & Schum. Fl. Deutschen Schutzgeb. Südsee, 207 (1901).
Northeastern New Guinea in Bismarck Mountains, 500 meters. (*Lauterbach*).

A. Nicolai, Burret, in Fedde, l.c. 263 is *Romanovia Nicolai,* Sander, a palm not yet sufficiently known, said to be originally from New Guinea.
Generic name Romanowia lacks botanical standing. It begins as a provisional nomen in Journal de la Société Nationale d'Horticulture de France, ser. iii, xxi, 665 (1899), in an account of a young plant on exhibition at the International Exposition in St. Petersburg. Brief condensation of the description appeared in the list of new plants in Appendix I to Kew Bulletin for 1900, page 50. In Gardeners' Chronicle, ser. iii, xxxiii, 245 (April 18, 1903) is a brief note about the palm (generic name Latinized Romanovia) and in the following week appears a large halftone plate of the plant as a "new palm shown at Ghent" from Hort.-Sander. Flowers and fruits were not known. Leaflets are widely spaced, short, narrowly triangular or at least with a long-cuneate base, apex broad and retuse in most cases with slender finger from upper and lower margin. In the writer's herbarium is a specimen grown nearly twenty years ago by an American dealer as *Kentia præmorsa* that appears to be this palm: the leaflets are less than 5 inches long not counting the fingers. The binomial *K. præmorsa* occurs, only a nomen, in Bulletin du Department de l'Agriculture aux Indes Néerlandaises, xxxi, 8 (1909), as in the Botanic Garden at Buitenzorg.
The palm *Romanovia,* or *Actinophlœus, Nicolai* must await definite determination.

A. propinquus, Burret, l.c. 271.
Drymophlœus propinquus, Becc. in Malesia, i, 43 (1877); one of the type species of Actinophlœus; see *A. ambiguus.*
Aru Island, near Vokan, New Guinea (*Beccari*).

A. punctulatus, Becc. in Engl. Bot. Jahrb. lii, 31 (1914).
Northeastern New Guinea near Bulu (*Schlechter* 16222).

A. Sanderianus, Burret, in Fedde, Repert. xxiv, 271 (1928).
Ptychosperma Sanderiana, Ridley, in Gard. Chron. ser. iii, 24, t. 126 (1898).
The palm described by Ridley has stem or trunk to 15 feet high and 1 inch diameter, with joints 1-3 inches long: leaf rachis brown-tomentose, particularly at the base; pinnæ more than 50 on each leaf, alternate, 1½ ft. long and ½ inch broad, narrow-linear, tapering toward the apex, the end with one long point and another

much shorter point with a deep notch between them: panicle rather large and with many brown-furry branches 8 inches or more long: fruit ½ inch long, ovoid and beaked, bright red, the seed deeply 5-grooved and not ruminate.

From New Guinea or the adjacent islands. The writer has specimens from botanic gardens under the Ridley name but the identity is uncertain.

A. Schumannii, Becc. ex K. Schum. et Hollr. Fl. Kais. Wilh. Land. 15 (1889) is *Ptychococcus Schumannii*, Burret, l.c. 273.

BALAKA, Becc. in Ann. Jard. Bot. Buitenzorg, ii, 91 (1885); Burret, in Fedde, Repert. xxiv, 273 (1928).

Separated from Ptychosperma by the non-sulcate seed with equable (not ruminate) albumen and by the very short irregular rhomboidal pinnæ. The fruit is ovoid or oblong, beaked; seed longitudinally angled but not grooved, pointed, base rounded. They are single-stemmed palms with very slender cane-like straight trunk, of low or intermediate height. Flower-clusters mostly once-branched, beneath the leaves. *Balaka* is a native name in Fiji.

Nine or ten Balakas are now known in Fiji, Samoa, Tahiti. Two names, *B. Seemanni* and *B. perbrevis*, of the Fiji Islands, appear in lists of culti-

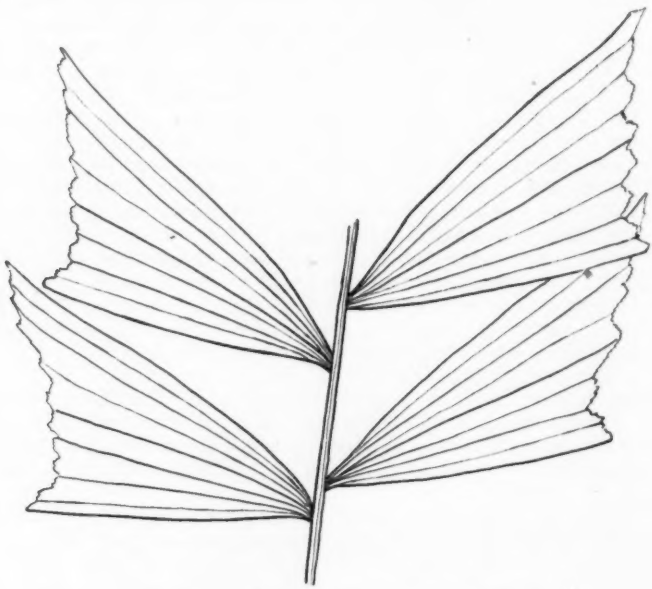


FIG. 246. FOUR PINNÆ of *Balaka perbrevis*, one-half natural size.

vators. The author has not seen a real Balaka in cultivation, however, such plants as pass under that name having been *Ptychosperma elegans*.

Pinnæ oblong-rhomboid, to 20 cm. (8 inches) long, apex long-oblique and irregularly jagged or erose, mostly without a noticeable projecting lobe on the lower margin..... *B. Seemanni*
Pinnæ broadly triangular-rhomboid and short, to 10 cm. (4 inches) long, slanting-truncate, lower margin usually produced into a short lobe, the upper margin projected to a prominent point..... *B. perbrevis*

Balaka Seemanni, Becc. l.c. Fig. 245.

Ptychosperma Seemanni, Wendl. in Bonplandia, x, 192 (1862), also in Bonplandia, ix, 261, *nomen nudum* (1861): Seemann, Flora Vitiensis, 272, t. 82 (1868).

Very slender palm in dense forests with cane-like stem or trunk to 4 m. (13 feet) tall and only 10-12 mm. (about ½ inch) thick, ringed as if jointed: leaves about 1 m. long, with about 8 or 9 pinnæ or segments alternate or irregularly placed on either side the rachis, tubular leaf-sheath, petiole, rachis and marginal ribs more or less scaly or lepidote; segments long-oblong-subrhomboidal, broadening from the base, 10-20 cm. long, glabrous, oblique at apex and irregularly toothed and jagged, upper margin projected into a long or short point, rather strongly several-ribbed, one rib constituting the upper margin and a lesser one on or near the lower margin: flower-cluster infrafoliar, 25-30 cm. (10-12 inches) long, at first brown-tomentose, once-branched and the two lower branches perhaps bearing another branch; flowers normally in 3's, the middle one pistillate, the triplets well separated on the somewhat fleshy terete rachillæ.

Balaka perbrevis, Becc. l. c. Fig. 246.

Ptychosperma perbreve, Wendl. l. c. x, 193; Seemann, l. c.

Somewhat taller and therefore more slender palm than *B. Seemanni*, to 5 m. (16 feet): leaves appearing more uniformly pinnate because of the 10 to 12 more regularly placed and sometimes nearly opposite pinnæ which are 8-10 or 12 cm. long and 6 or 7 cm. broad at the much expanded apex which is irregularly serrulate-crenate and both margins somewhat projected, the blade with about 3 prominent ribs and 2 marginal ones and lesser veins between, petiole and rachis and marginal veins lepidote: flower-cluster much as in the preceding species, glabrous.

Pictures herewith of the Balakas are as follows: tree of *B. Seemanni* in Fig. 245 redrawn from Seemann's Flora Vitiensis (cf. Fig. 178 Cyclopedia of American Horticulture and 449 Standard Cyclopedia of Horticulture); pinna or leaflet of *B. Seemanni* from Seemann's no. 664 from Viti or Fiji Islands, 1860, cotype in the Gray Herbarium; pinnæ of *B. perbrevis* in Fig. 246 from Pickering's original collection, Wilkes' South Pacific Exploring Expedition, 1838-42, at Sandal Wood Bay, Fiji, cotype in the Gray Herbarium.

HYDRIASTELE,, Wendl. & Drude, in Linnaea, xxxix, 180 (1875). Fig. 247.

Tall palms with simply branched spadices or flower-clusters: leaves pinnatisect, with the segments unequally spaced on the rachis and those

at the apex confluent, ends of segments obtuse and erose-denticulate with the front margin produced into a lobe or tail: fruit drupe-like, elliptic, about 10 mm. (¼-⅓ inch) long, not sulcate, albumen equable. Name *Hydriastele* is a fanciful Greek combination signifying *water column* (*water-nymph c.*), as the tall trunk grows near springs.

Four species are described, three in Australia and one in New Guinea, one of which has been transferred by Beccari to Gulubia, a reference questioned by Burret (Fedde, Repertorium, xxiv, 292, 1928). The name *Hydriastele Wendlandiana* is widely known in horticulture although the species is apparently not in cultivation. The planted palms so named are Ptychosperma (*P. elegans* and *P. Capitis Yorkii*).

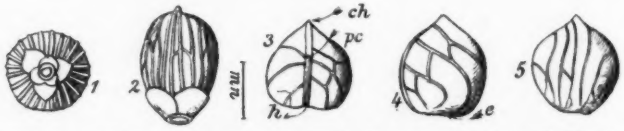


FIG. 247. FRUIT CHARACTERS of the little known *Hydriastele Wendlandiana* of Northern Australia, erroneously supposed to be in cultivation, being the original illustration of Wendland & Drude (same size), 1875.

1, basal view of fruit with enlarged perianth; *2*, erect or side view, twice natural size; *3*, dorsal view of seed with raphe from hilum at *h* to highest point of cohesion (*pc*) with the endocarp; *4*, lateral view of seed; *5*, front view.

The species *Hydriastele Wendlandiana*, Wendl. & Drude, l. c., is transferred from *Kentia Wendlandiana*, F. Muell., Fragmenta Phytographiæ Australiæ, vii, 102 (1870). It was founded on a collection by B. Gulliver on Liverpool River, Northern Territory of Australia, an inaccessible location. Subsequent collections in Queensland referred to it are at least very doubtful. On this point, Bentham writes in Flora Australiensis, vii, 138 (1878) that the North Australia and Queensland "specimens appear to belong to one species, but it is possible that when better known they may prove to be distinct." Note the discussion under Ptychosperma.

The original diagnosis by Von Mueller (as *Kentia Wendlandiana*), before this palm was confused with others, calls for a very tall pinnate-leaved tree with crowded unequal pinnæ, the uppermost segments a span long (7 inches) and confluent, middle pinnæ as much as 18 inches long and 2 inches broad, all plicate, nerved, the ends oblique and irregularly truncate and erose: peduncle scarcely exceeding 18 inches, the spikes or rachillæ numerous, glabrous, fastigiate and about 12 inches long: fruit drupe-like, globose-ovoid and acutish, red, about ⅓ inch long, rugose-striate when dry; seed ¼ inch or less long, albumen plain.

RHOPALOSTYLIS, Wendl. & Drude, in Linnaea, xxxix, 180 (1875). *Eora*, O. F. Cook, in Journ. Heredity, xviii, 409, note (Washington, Sept. 1927).

Single-stemmed palms with strongly annular trunks and attractive compact crown of upwardly spreading leaves, the sheathing bases of which make a short crownshaft: spadix infrafoliar (at base of crownshaft), soon becoming spreading or drooping after the falling of the two deciduous papery spathes, many-fingered or -branched: flowers in 3's, central one pistillate, closely placed on the rachis; staminate flowers with 3 very narrow pointed sepals, and 3 much larger valvate petals, stamens 6, pistillode or rudimentary style conspicuous and cylindric or club-shaped (whence the name *Rhopalostylis*, clavate style); pistillate flowers small, globose-narrowed, 3 sepals imbricate, 3 petals valvate at tips, ovary ovoid, staminodes minute: fruit to nearly ¾ inch long, almost globular to ellipsoid, red, with thin exocarp beneath which is an attached region of longitudinal fibers, sitting in a prominent cupule which remains on the axis when the drupe falls; seed globular to ovoid or short-oblong, with adhering longitudinal fibers, the albumen equable.

New Zealand, with Chatham and the Kermadec Islands, and Norfolk Island. Three species are now well recognized, and a fourth has been proposed; apparently only *R. sapida* is planted in

FIG. 248. CHARACTERISTIC FEATHER-DUSTER HEADS OF NIKAU PALM in the bush at the kauri country in northern New Zealand.—*Rhopalostylis sapida.*

the United States, but the others may be briefly indicated in case there is suspicion of their occurrence here.

The brief euphonious generic name Eora (Greek meaning "borne aloft or uplifted" because of the ascending habit of the fronds) was proposed by Cook in 1927 to avoid the earlier use of the name Rhopalostylis by Klotzsch

Fig. 249. Head of Nikau palm, *Rhopalostylis sapida*, as seen in its native place in northern New Zealand.

Drawing at right, pinna or leaflet of *R. sapida* (× about ⅓), folded in three lengths; from a large leaf on a bearing tree.

for an euphorbiaceous plant in Adansonia, v, 717 (1865); this prior Rhopalostylis is entered in Index Kewensis on the authority of Baillon. It appears, however, that the Klotzsch name was never botanically published as a genus and has no standing under the Rules. The citation by Pax and Hoffmann in Das Pflanzenreich, iv, 147, xii, 7 (1919) does not validate its earlier publication as a genus; they employ the name for a section of Dalechampia. Cf., also, Burret, in Fedde, Repert. xxiv, 259, note.

Fruit ovoid to elliptic: fruiting perianth cupulate-campanulate.
Spadix (flower-cluster) short, 30-60 cm. (2 feet or less) long: seed with adhering tight fibers light colored.....*R. sapida*
Spadix large, to 90 cm. long (to 3 feet): seed dull brown.....*R. Baueri*
Fruit globose: fruiting perianth open and spreading (almost explanate).
.....*R. Cheesemanii*

FIG. 250. CROWNSHAFT of *Rhopalostylis sapida*, with leaf-crown above and spadices below, one at the right not yet opened so that the two separate spathes do not show. Southern California.

Rhopalostylis sapida, Wendl. & Drude, in Kerchove, Les Palmiers, 255 (1878). NIKAU PALM. Figs. 240, 248, 249, 250.

Areca sapida, Soland. ex Hook. f. in Fl. Nov. Zelandiæ (Bot. Antarctic Voy. i, 262, t. 59, 60, 1853); Handb. New Zeal. Fl. 288 (1867).

Eora sapida, O. F. Cook, in Journ. Heredity, xviii, 409 (1927).

FIG. 251. FRUIT-BEARING, in various stages, of *Adonidia Merrillii*; lowest cluster nearly mature. Canal Zone.

Erect attractive palm of medium size to 8 m. (25 feet) tall, with strongly ringed stiff trunk: leaves a dozen or so, 1-2½ m. long and closely evenly pinnate, petiole very short on mature plants, pinnæ many, to 1 m. long and 5 cm. broad, ascending on the rachis, with very strong midrib and many prominent intermediate nerves, more or less plicate, furfuraceous on ribs and margins, long-tapering to a narrow somewhat split point: spadix mostly under 2 feet long, branching from near the base, usually 2 or 3 together, the rachillæ closely packed with purplish flowers: fruit or thin-fleshed drupe light red, 11-14 mm. (nearly to about ½ inch) long, and 7-8 mm.

diameter, elliptic in outline, the shell thin when dry; seed nearly filling the shell.

New Zealand, North and South Islands, most abundant in the former. Cheeseman attributes this palm to the Chatham Islands, that lie east of New Zealand; but Cook states that "for the Chatham Island Palm the name *Eora ultima* would be suitable. Von Mueller says that it has a tomentose midrib, but corresponds in other respects to the description of *sapida*" (Journ. Heredity, xviii, 409, note). The midrib of the leaf of *R. sapida* is heavily furfuraceous, or, as Cheeseman describes it, "midrib and main veins covered with lepidote scales."

Sometimes in California the thick trunk of *R. sapida* remains only a foot or two high and the flower-clusters are nearly at the surface of the ground.

Rhopalostylis Baueri, Wendl. & Drude, in Linnaea, xxxix, 234 (1875); Kerchove, l.c.

Seaforthia robusta, Hort. ex Wendl., in Kerchove, l.c. 257.
Eora Baueri, O. F. Cook, l.c.

FIG. 252. THE RED HANDSOME FRUITS of *Adonidia Merrillii,* grown in Cuba; nearly natural size.

A tall palm with larger spadix than that of *sapida* and fruit considerably larger, being 15-17 mm. long and 12 mm. diameter; seed dull brown.

Norfolk Island, northwest of New Zealand.

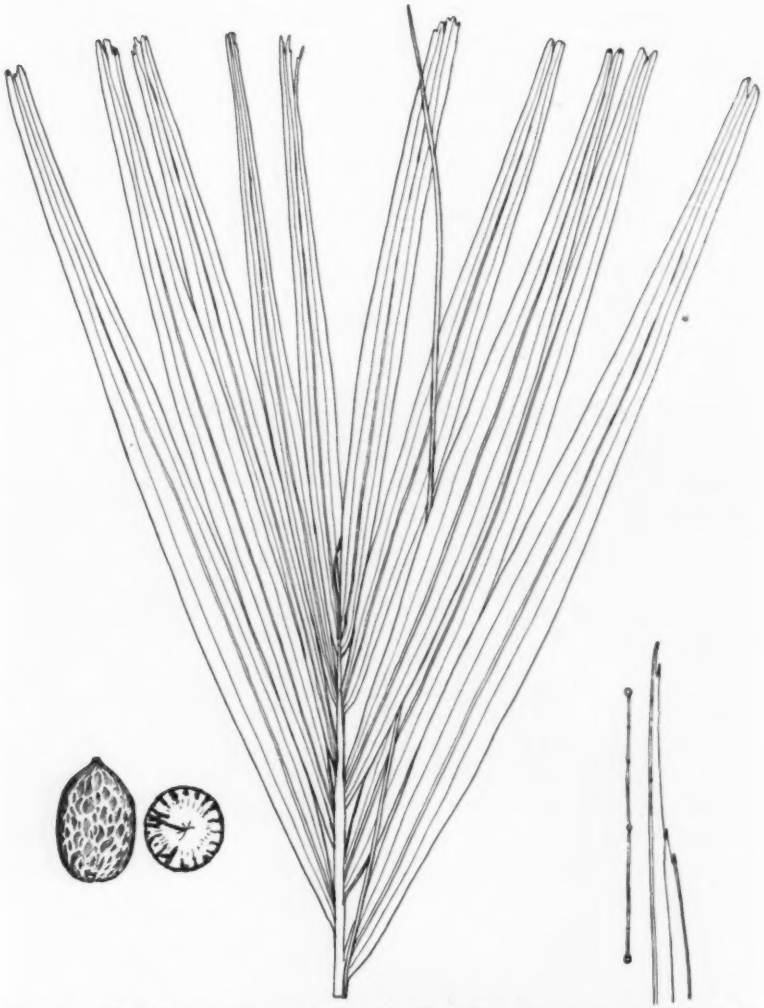


FIG. 253. THE MANILA PALM, *Adonidia Merrillii*. Tip of fresh unbroken leaf (×⅓). Right, cross-section of a pinna, natural size, to show the two marginal ribs; tip of a lateral pinna, one-half full size. Seed in side view and cross-section (× 1).

Rhopalostylis Cheesemanii, Becc. ex Cheeseman, Trans. New Zeal. Inst. xlviii, 215 (1916); xlix, 47 (1917).

Eora Cheesemani, O. F. Cook, l.c.

Tall, to 18 or 19 m. (60 feet), stout: fruit globose, 11-13 mm. diameter; seed globose, light colored; fruiting calyx spreading.

Sunday Island, in the Kermadecs northeast of New Zealand.

ADONIDIA, Becc. in Philippine Journ. Sci. xiv, 329 (1919).

Genus of a single species separated from Normanbya in having pinnæ regularly distributed along the rachis and attenuate to the apex as well as bearing a strong costa or rib on either margin and likewise in the middle; also in the fruits, as disclosed in the descriptions herewith. A showy palm in fruit, recognized in the name Adonidia (*Adonis, -idis,* mythical youth of beauty).

Adonidia Merrillii, Becc. l.c. MANILA or MERRILL PALM. Figs. 251, 252, 253.

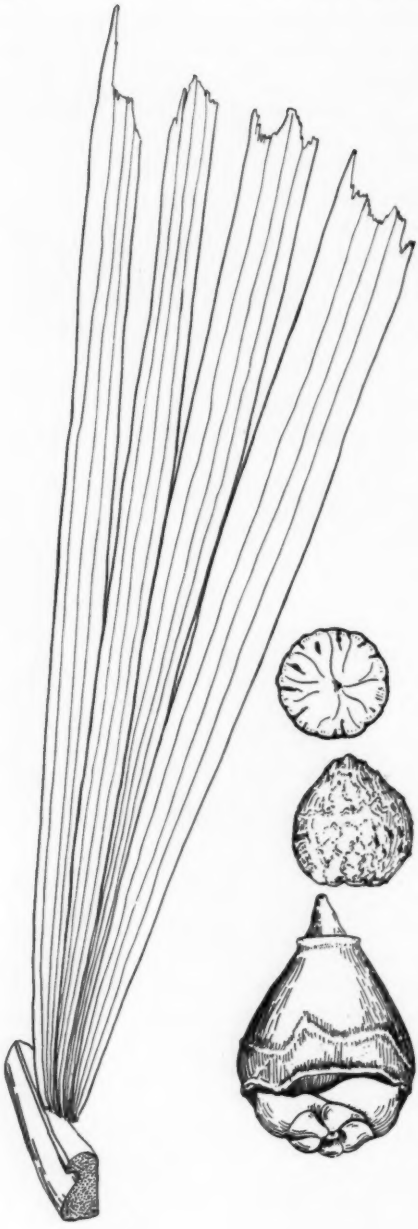
Normanbya Merrillii, Becc. in Philippine Journ. Sci. iv, 606, t. 30, 31 (1909).

Erect rather stocky palm to 6 m. (20 feet) tall, trunk somewhat tapering and sometimes not directly straight, prominently ringed, bearing a crown of 9-12 gracefully arching pinnate leaves, and a crownshaft beneath which the flowers are borne: leaves to 2 m. long, short-petioled and with cylindrical sheath, pinnæ about 50 on either side rachis and nearly equally placed, leaflets to 70 cm. (about 30 inches) long and to 5 cm. broad, bright green and glabrous, gradually tapering to a nearly entire or shallowly split end, midrib and marginal ribs showing strongly on under side as well as many intermediate nerves: spadix short-peduncled, much branched, glaucous, with many slender glabrous rachillæ; staminate buds very large, 1 cm. or more long: fruit ovoid-pointed or cartridge-shaped, 3 cm. (1½ inches) or more long and about 2 cm. thick, bright red in compact clusters, cupule conspicuous and 1 cm. long, flesh thin and soon drying in longitudinal ridges over the fibrous mesocarp; seed oblong, 2 cm. long, within a shell, its surface tessellate-mottled, albumen with ruminate intrusions one-third or one-half its depth.

Philippines. Commonly planted in Manila for ornament, properly named and described from cultivated specimens provided by Dr. E. D. Merrill before the origin was botanically known, previously having been erroneously referred to *Actinorhytis calapparia.* It was subsequently found to be native in great abundance on the rough limestones of Coron and of Palawan in the southwestern part of the archipelago. This palm is planted in the American tropics; the writer has it from Cuba and Canal Zone.

NORMANBYA, F. Muell. Fragm. Phyt. xi, 57 in obs. (1878); Becc. in Ann. Jard. Bot. Buitenzorg, ii, 91 (1885).

Tall large-fruited graceful pinnate palm known specially by the clustered pinnæ or leaflets which are united at base as if one pinna were split into several and also by the truncate erose or jagged broad apex; pinnæ lacking a distinct midrib but bearing several strong costæ.



One Australian palm, dedicated to the Marquis of Normanby.

Normanbya Normanbyi, Bailey, Gent. Herb. ii, 188 (1930). Normanby Palm. Fig. 254.

Cocos Normanbyi, W. Hill, in Rept. Brisbane Bot. Gard. 1874, p. 6, apud Von Mueller.

Areca Normanbyi, F. Muell. Fragm. Phyt. viii, 235 (1874).

Saguerus Australasicus, Wendl. & Drude, in Linnaea, xxxix, 219 (1875), apud F. Muell. Fragm. Phyt. xi, 56.

Ptychosperma Normanbyi, F. Muell. Fragm. Phyt. xi, 56, 57 (1878).

Drymophloeus Normanbyi, F. M. Bailey, Queensl. Fl. v, 1678 (1902).

Normanbya Muelleri, Becc. in Agric. Coloniale, x, 615, Firenze (1916).

Trunk erect to 20 m. (60 feet or more), somewhat enlarged at base, wood dark

Fig. 254. The Normanby palm, *Normanbya Normanbyi*. Leaflet cluster, one-half full size. Fruit, seed in side view and in cross-section, about natural size.

colored and very hard: leaves 2-4 m. long, nearly or quite sessile, rachis more or less scurfy; pinnæ or segments in fascicles of 2 to several that are free nearly or quite to the base, some of them only 15 cm. long but mostly 30-45 cm. in length and 1-3.5 cm. broad, not narrowing to apex, prominently many-ribbed, apex truncate or somewhat oblique, erose with one margin somewhat prolonged: spadix below the leaves, much branched, peduncle short, main branches flattened and angled, rachillæ stout and mainly cylindrical and thick but flowers not sunken: flowers typically in 3's but often solitary and scattered, petals of the staminates valvate and of the pistillates imbricate, staminodia none: fruit ovoid-pointed or obpyriform, 4-5 cm. (1½-2 inches) long and about 3 cm. broad toward base, reddish to purple-brown, exocarp somewhat fleshy when fresh but drying hard and irregularly cross-wrinkled, strongly beaked beyond an apical ring, cupule prominent; seed broadly ovoid, about 2 cm. broad and high, roughly irregularly ridged, albumen very hard marked with ruminate processes and canals.

Native in northern Queensland in rain forests; planted sparingly in tropics. Care must be taken not to confuse this palm with *Normanbya Merrillii*, which is properly Adonidia.

If anybody is annoyed by the tautology in the binomial *Normanbya Normanbyi*, the answer is that the case conforms to the Rules. The specific name *Normanbyi* has followed the plant from the original description under four generic names, and there is no warrant for dismissing it from the fifth genus. If there is fault in the disposition of the nomenclature it lies in the making of the generic name *Normanbya*, thus nearly duplicating the only specific name in the genus. In founding the genus, Mueller did not pause to make a new binomial; and at that time (1878) formal International Rules of Nomenclature were not established. Apparently to avoid the repetition of names Beccari proposed the new name *Normanbya Muelleri*, but this disposition cannot be allowed. A comparable case is *Sullivantia Sullivantii*.

Gray.
L. H. Bailey

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With note on Roystonea (Euterpe).

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*Since the publication of the Roystonea paper last April the writer has been favored by correspondence with Dr. Max Burret on the identity of *Euterpe caribæa* of Sprengel. Persons who may have consulted the paper will recall that Sprengel's binomial was made a synonym of *Roystonea oleracea*.

The account of *Euterpe caribæa* by Sprengel in his Systema, ii, 140, in 1823, is as follows (the name being starred):

E. frondibus pectinato-pinnatis glabris, floribus laxis, fructibus oblongis subincurvis. *Ins. Carib.* (Areca oleracea Jacq.)

There is little in this description for the identification of a palm, the only special character being the subincurved oblong fruit, a feature that really applies to *Roystonea oleracea* among the royals (Bailey, page 367).

When he founded the genera Roystonea and others in 1901 O. F. Cook did not discuss *Euterpe caribæa*, but Dammer and Urban in 1903 took it up as *Oreodoxa caribæa* to displace Cook's *Roystonea borinquena*. Beccari followed this treatment in his monograph of 1912 (spelling the name *charibæa*). Percy Wilson in 1917 made the binomial *Roystonea caribæa* for the Puerto Rico royal. Britton and Wilson in their treatment of the spermatophyta of Puerto Rico in 1923 (page 112) threw the name into synonymy of *R. borinquena*, however, inasmuch as "the name *Euterpe caribæa* Spreng. is based on *Areca oleracea* Jacq." The name proposed by Sprengel has been considered to be too uncertain to warrant restoration. The writer held this view, and followed Britton and Wilson in the treatment of *Roystonea borinquena*, making *R. caribæa* of Wilson a synonym.

The question at issue is whether Sprengel merely gave a new name to *Areca oleracea* of Jacquin (which is now *Roystonea oleracea*) or whether he intended to describe a wholly new species. He did not accept Oreodoxa (now Roystonea) and distributed the species in other genera. The fact that Sprengel had a specimen from Puerto Rico collected by Bertero (see Urban & Dammer, Symbolæ Antillanæ, iv, 129) does not demonstrate that he meant the Puerto Rico royal but may possibly have had an introduced species, and his statement of the lax flowering habit and oblong subincurved fruit suggests it: with these characters removed, there is nothing in the Sprengel account to aid in identification. Perhaps Sprengel did not make his description from the Puerto Rican specimen, particularly as he does not mention that bisland ut refers his plant to the Caribbean islands.

The Sprengel specimen is at Berlin-Dahlem. Dr. Burret has examined it and pronounces it the same as *R. borinquena* and concludes that Sprengel described a new species (as is indicated by the giving of a new specific name rather than the transferring of a previous name) and that *Roystonea caribæa*, Wilson, should be adopted for the Puerto Rico royal palm.

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